AMERICAN ANTIQUITY

USEUM LIBRARY
E
51
.A495

MAY 31 1949

VOLUME XIV

NUMBER 4—PART 1

APRIL 1949

PUBLISHED BY THE SOCIETY
FOR AMERICAN ARCHAEOLOGY

THE SOCIETY FOR AMERICAN ARCHAEOLOGY

OFFICERS

President: WALDO R. WEDEL, U. S. National Museum, Washington 25, D. C.

First Vice-President: WILLIAM S. WEBB, University of Kentucky, Lexington, Kentucky.

Second Vice-President: ANTONIO SERRANO, Instituto de Arqueología, Lingüística, y Folklore, Universidad Nacional de Córdoba, Córdoba, Argentina.

Secretary: GEORGE I. QUIMBY, Chicago Museum of Natural History, Chicago 5, Illinois.

Treasurer: GLENN A. BLACK, Angel Mounds, R. R. No. 3, Newburgh, Indiana.

Editor: IRVING ROUSE, Peabody Museum, Yale University, New Haven, Connecticut.

Associate Editor: JAMES B. GRIFFIN, Museum of Anthropology, University Museums Building, Ann Arbor, Michigan.

Assistant Editors: FREDERICA DE LAGUNA, Arctic; ROBERT F. HEIZER, Pacific Coast; PAUL REITER, the Southwest; WALDO R. WEDEL, the Plains; RICHARD G. MORGAN, the Northern Mississippi Valley; WILLIAM A. RITCHIE, the Northeast; WILLIAM G. HAAG, the Southeast; GORDON F. EKHOLM, Middle America; GORDON R. WILLEY, South America; FRANK H. H. ROBERTS, JR., Early Man.

Members of the Executive Committee: The President, First Vice-President, Second Vice-President, Secretary, Treasurer, and Editor; GORDON F. EKHOLM, E. W. GIFFORD, ERIC REED, and M. W. STIRLING to 1949; JOHN L. CHAMPE, PHILIP DRUCKER, W. C. HAAG, and ROBERT F. HEIZER to 1950; PHILIP PHILLIPS and GORDON R. WILLEY to 1951.

AMERICAN ANTIQUITY is printed by the George Banta Publishing Company, 450–454 Ahnaip Street, Menasha, Wisconsin, U.S.A.

Published by the SOCIETY FOR AMERICAN ARCHAEOLOGY, during the months of January, April, July, and October. Subscription by membership; annual dues of $6.00 includes quarterly issues of AMERICAN ANTIQUITY and other releases, as issued.

Entered as second-class matter July 22, 1935, at the post office at Menasha, Wisconsin, under the Act of March 3, 1879.

Proposed articles and contributions to "Facts and Comments" should be submitted to the Editor, Irving Rouse; publications for review, reviews, and material for "Notes and News," to the Associate Editor, James B. Griffin.

Subscriptions and orders for back numbers should be addressed to the Treasurer, Glenn A. Black.

Please address all requests for information to the Secretary, George I. Quimby.

A

VOL.

T

papers
archae
1947).
sponso
Archa
the ob
of sci
from
develo
voirs,
conten
ments
many
a grea
rial, it
were n
of ma
history

In t
the fi
covery
sponso
July,
reserv
been e
Prelim
in ma
that i
selecte
of arch
date, a
atic ex
able.

AMERICAN ANTIQUITY

VOL. XIV APRIL, 1949 NO. 4

ARCHAEOLOGICAL RESEARCHES IN THE MISSOURI BASIN BY THE SMITHSONIAN RIVER BASIN SURVEYS AND COOPERATING AGENCIES

FOREWORD

TWO years ago, in the April, 1947 issue of AMERICAN ANTIQUITY, appeared a series of papers concerned with the River Basin Survey archaeological program (Brew and others, 1947). As the published record of a symposium sponsored by the Committee for Recovery of Archaeological Remains, those papers set forth the objectives and plans for a major program of scientific salvage. This undertaking stems from the nation-wide Federal water-control developments, whereby hundreds of dams, reservoirs, irrigation facilities, and other works are contemplated. Inasmuch as these developments will necessarily involve large sections of many of our stream valleys, where also exists a great proportion of our archaeological material, it was pointed out that immediate steps were necessary to forestall complete destruction of many of our basic data on American prehistory.

In the Missouri River Basin, largest and also the first of the full-scale archaeological recovery projects to get underway, Federally-sponsored field work has been in progress since July, 1946. Fifty-four proposed and potential reservoir areas scattered over seven states have been examined, wholly or in part (Fig. 65). Preliminary reconnaissance has been followed in many instances by intensive survey, and that in turn by detailed excavation at a few selected projects. Nearly 800 sites and localities of archaeological interest have been recorded to date, and recommendations made for systematic excavations where they are deemed advisable.

The recovery operations at Federal water-control projects have been made possible through a series of inter-bureau agreements. To the National Park Service, the Bureau of Reclamation, and the Corps of Engineers, American archaeology will long be indebted for the existence and continued support of the work. The active cooperation of numerous state agencies has likewise been a gratifying development—a development, be it noted, on whose continuance the successful furtherance of the recovery work depends heavily.

The present series of papers present some of the results of recent archaeological researches in the Missouri Basin. Three, those by Cooper, Hughes, and Kivett, are by Missouri River Basin Surveys personnel.[1] Four others, by Champe, Hewes, Holder, and Smith, deal with work by state agencies acting under cooperative agreements with the River Basin Surveys office of the Smithsonian Institution. Meleen's paper reports on investigations, part of them pre-war and thus antedating inception of the recovery program, in the lower Oahe reservoir area. All of the papers deal largely or entirely with remains that will be, or would have been, directly affected by the water-control program.

WALDO R. WEDEL
River Basin Surveys
Smithsonian Institution
Washington, D. C.
January, 1949

[1] Published by permission of the Smithsonian Institution.

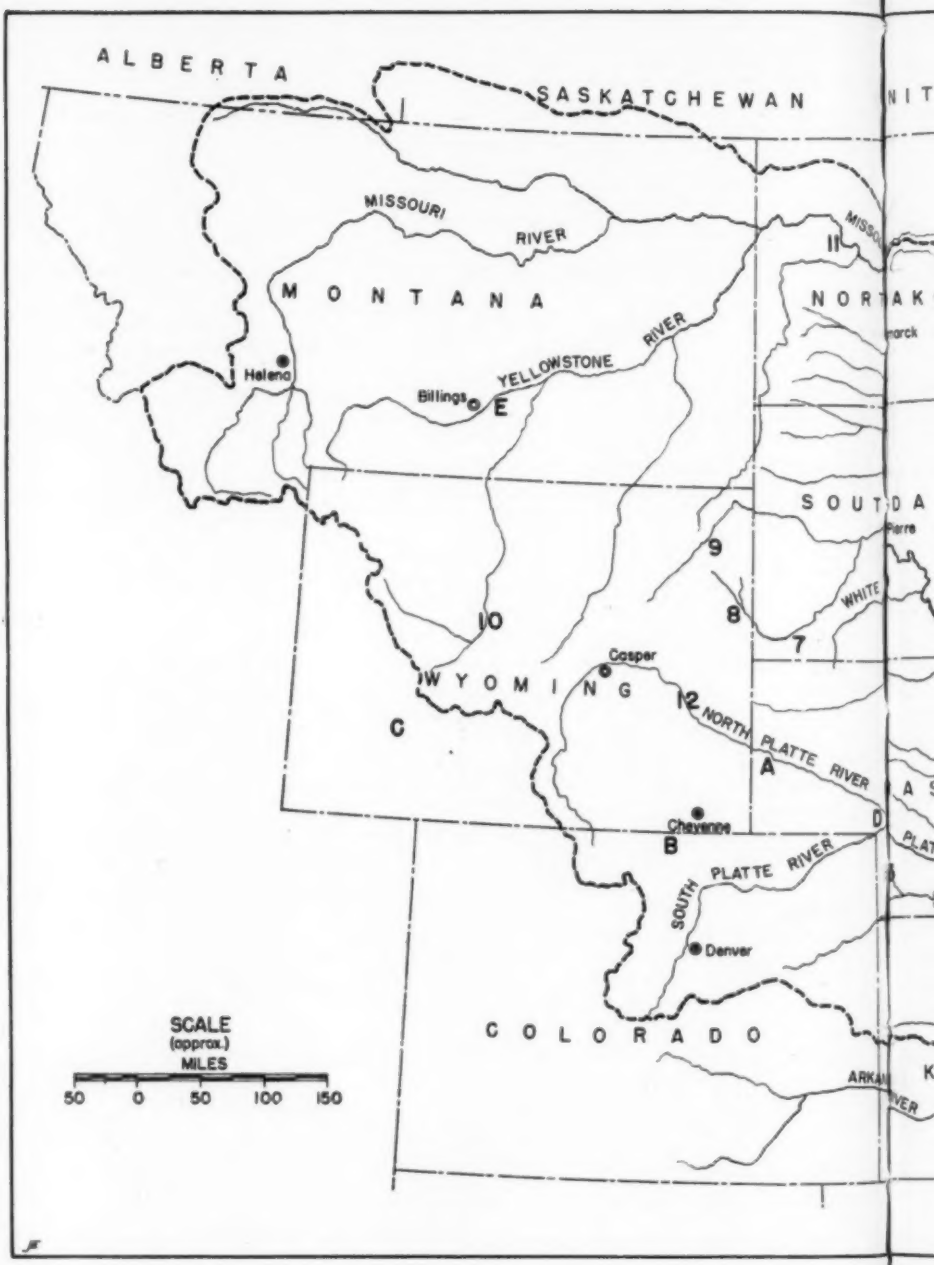
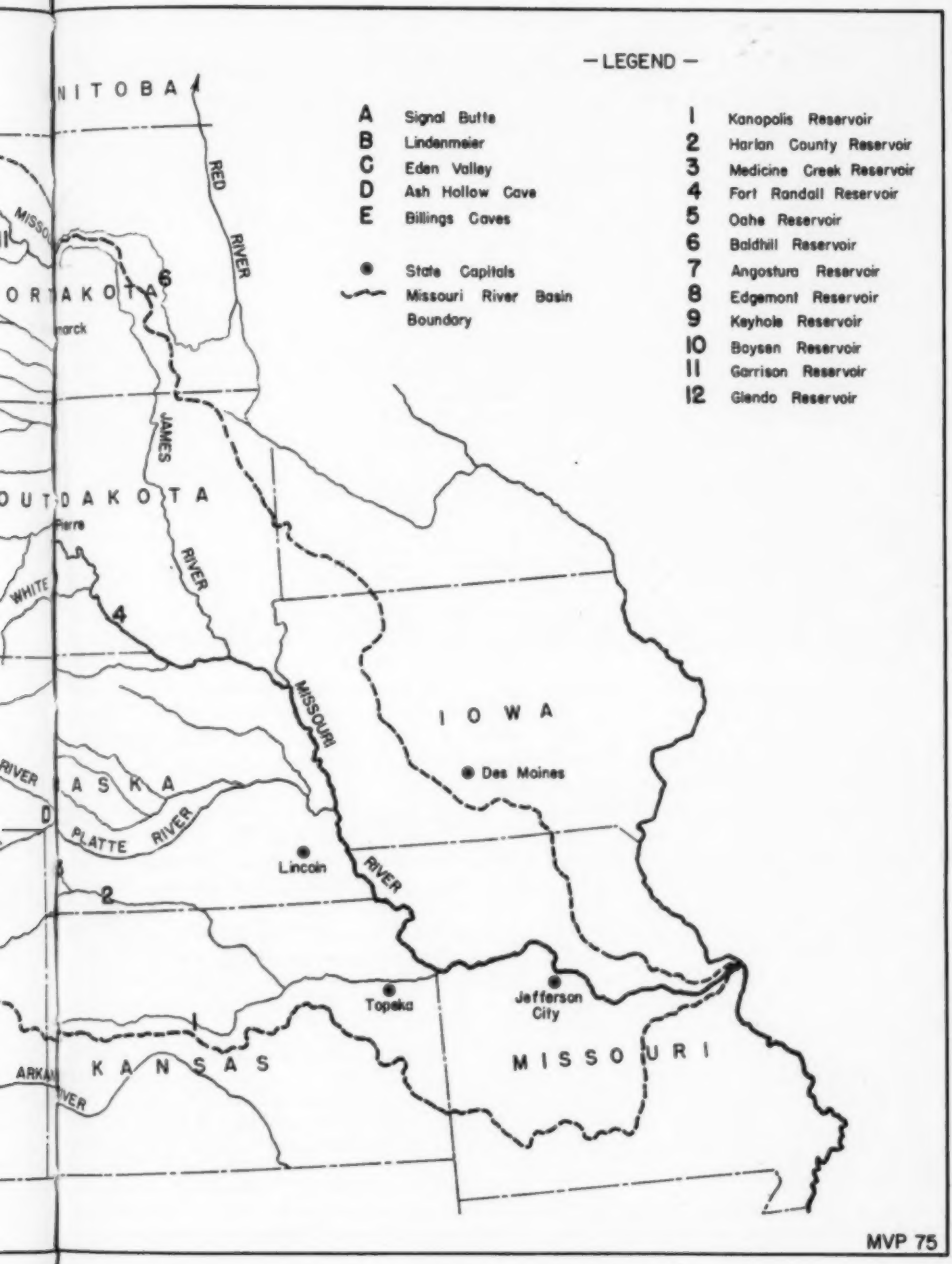


FIG. 65. Missouri River Basin (heavy broken line), showing some of the proposed reservoirs recently by the



recently by the Missouri River Basin Archaeological Survey, Smithsonian Institution, and cooperating agencies.

THE FRONTIER CULTURE COMPLEX, A PRELIMINARY REPORT ON A PREHISTORIC HUNTERS' CAMP IN SOUTHWESTERN NEBRASKA

PRESTON HOLDER AND JOYCE WIKE

THIS report, a preliminary delineation of a new lithic complex from the Central Plains, is presented for the immediate purpose of aiding other archaeologists working in the area. Once one has left such easily recognizable markers as the Folsom complex, the details of the archaic horizons of the Great Plains are confused until we reach such lithic complexes as those found at Signal Butte (Strong, 1935), Ash Hollow Cave (Champe, 1946), and more recently, Nebo Hill (Shippee, 1948). The primary value of defining the Frontier Culture complex at this time is that it affords a "pure" and relatively complete lithic complex by means of which comparative typological work in the Plains Archaic can be furthered.

All elements of the Frontier complex are found widespread both temporally and spatially. We cannot point to a single "diagnostic trait." Thus we are forced to consider the specific pattern of elements as a functionally interrelated complex, the material evidence of one of many adaptations which hunters and gatherers made within what is probably a widespread and relatively simple pattern of life on the Great Plains prior to the relatively late appearance of prehistoric horticultural techniques.

The Allen site (Ft-50) is one of three buried sites discovered by the University of Nebraska State Museum within the radius of a few miles in the Medicine Creek Dam reservoir area of the upper Republican drainage.[1] In the summer of 1947, the Museum conducted test excavations of the sites Ft-41 and Ft-42 on Lime Creek, and the Allen site (Ft-50) on Medicine Creek (Schultz and Frankforter, 1948; Wedel, 1948*b*, pp. 42–3). The Allen site (Ft-50) was set aside to utilize the special training of experts in geomorphology, soils, sedimentation, paleontology, and archaeology, in a thorough examination during the 1948 season. The authors were engaged to supervise the archaeological excavations. The results of this interdisciplinary research will be presented in a final symposium to be published soon in the University of Nebraska State Museum series. The authors are grateful to Dr. C. B. Schultz in his dual capacity as director of the museum and director[2] of the project for his permission to present this brief preliminary report of the archaeological material.

The cultural debris at the site occurs in a band some 2.5 to 3.0 feet in thickness which begins about 9 feet above the base of the fill of a terrace remnant that is some 30 feet high at this point along Medicine Creek. In a preliminary report of the geomorphology of this area Schultz, Lueninghoener, and Frankforter (1948, pp. 36-8) have indicated provisionally that the site is in the base of Republican River Terrace 2 fill which they have provisionally correlated with the Mankato sub-stage of the Wisconsin glacial stage.

Figure 66 shows a view of the site during excavation after the bulk of the overburden had been removed by machinery. The man at the extreme right (north) is standing on a surface near the bottom of the culture-bearing strata. Behind him the eroded face of the terrace drops down toward Medicine Creek which has cut through 15 feet or more of the underlying Cretaceous rock (Niobrara chalk) at this point

[1] The Allen site is designated by the code name Ft-50 (Frontier County, Site 50) in accordance with University of Nebraska State Museum practice. The site is referred to as 25FT50 in the Smithsonian Institution code (Wedel, 1948). The site is on land which was homesteaded in 1873 by William H. Allen and is now owned by Herbert C. Allen.

[2] W. D. Frankforter acted as co-director of the work for the Museum at the Allen site as well as at the other projects in the Medicine Creek and Harlan County reservoir areas. Loren Toohey was paleontologist at the site and was responsible for personnel problems. H. E. Robinson and C. L. Mutch of the Bureau of Reclamation cooperated with the Museum field party by making earth-moving equipment and personnel available for the removal of the overburden at the site. Funds for the archaeological and paleontological work at the Allen site were furnished by the late Hector Maiben (through the University of Nebraska Foundation) and by the Chancellor and Board of Regents of the University.

FIG. 66. Excavation at the Allen site, Medicine Creek, Nebraska.

and is flowing in a southeasterly direction. The men in the right foreground are removing the last of the protective layer of terrace fill which the machines left and are uncovering the uppermost surface of occupation. The occupation layer slants upward to the left (south) where the man at the extreme left has exposed its upper surface.

Artifacts, flint chips, charcoal, fragments of hematite, disarticulated, broken animal bones, and other faunal and floral remains were scattered at random throughout the matrix of the entire occupation layer. However, it was possible to distinguish two consistent levels of relatively concentrated debris and stained matrix. These were designated Occupation Level I, the lower, about 0.5 foot to 0.8 foot in thickness, and Occupation Level II, the higher, 0.4 foot to 0.6 foot. They were separated by an Intermediate Zone, about 1.5 feet of lighter colored matrix in which there was much less cultural material.

Approximately 512.5 cubic feet of matrix removed from Occupation Level I contained 68 identifiable artifacts, 9 remains of campfires, and, according to Dr. Schultz's preliminary announcement (*Sixth Plains Archeological Proceedings*, in press), some 80 per cent of all faunal material recovered at the site. Only 12 identifiable artifacts and the remains of one campfire were found in about 1,537.5 cubic feet of Intermediate Zone matrix. Evidence of 10 campfires and 26 identifiable artifacts were recovered in some 612.5 cubic feet of Occupation Level II earth.

On the basis of preliminary field identification, remains of large mammals at the site include bison, antelope, and deer. Small mammals were represented by coyote, rabbit, mice, rats, and prairie dogs. Beaver and fish were extremely rare. There were occasional reptiles, amphibia, and birds; and at least two varieties of clams were found. Scattered shell fragments occurred on all levels in small quantities. Burned nests of the mud-dauber wasp were found throughout; although characteristically broken open, several were recovered in an unbroken state and there was at least one unfired nest. Extremely small gastropod shells and hackberry seeds occurred in considerable con-

centrations throughout the occupation layer but their association with human activity is dubious.

Not only were the majority of the faunal remains concentrated in Occupation Level I but in Occupation Level II there were merely a few fragments of bison bones, suggesting that further analysis may show significant changes in the faunal population represented on the two levels. Virtually all of the large mammal bones showed signs of human activity: they were cut, broken, scratched, and otherwise reduced to fragments. There were no large mammal skulls and only a few intact large, long bones.

A striking feature of Occupation Level I were long windrows of broken and disarticulated bones scattered along the old surface. There was a preponderance of bison in these piles. Although some bones showed evidence of firing, campfires had been located principally in areas not occupied by the windrows.

There were no prepared hearths. The campfire remains were those of small fires built on the old surfaces of the site for varying lengths of time as reflected in the relative amount of color change in the underlying matrix. Analysis on this basis revealed that eight of the nine hearths on Occupation Level I were heavily fired; the one hearth from Intermediate Zone was lightly fired. Of the ten hearths on Occupation Level II, four were heavily fired, three were lightly fired, and the remaining three represented an intermediate degree of firing.

On the basis of the condition and nature of the faunal remains and the distribution of fired areas we can be certain that the archaeological remains represent the debris of a relatively permanent hunting encampment. This interpretation is further borne out by the range of artifact types found at this site. Although there is a meager artifact-to-matrix proportion and the total inventory is small the variety of tool types is striking. We will describe them and discuss their typological affinities below in outline form.

I. STONE ARTIFACTS

A. Chipped Stone

The majority of the specimens in this category were made from a local tan jasper although there were some tools of flinty agate and occasional chips of chalcedony-like material. Frontier complex tools were not characterized by especially fine workmanship in stone. The control of flaking and, in particular, of retouching, does not approach the skill of such manufacturing traditions as that of the Folsom complex or some of the California Central Valley horizons (Beardsley, 1948). There is every evidence that clearly defined "styles" were being followed in the flint-chipping industry, although further examples of Frontier complex tools may show variation.

Projectile points. The basal portion of all finished projectile points had been thinned by the removal of small, central spalls, generally from one face only. An approximately rhomboidal cross section across the short axis resulted from a characteristic retouching of alternate faces of the edges.

a) Small projectile points (Fig. 67, *h*). Two leaf-shaped crescent-based projectile points were found, one on each major occupation level. They were about 4 cm. long, 2 cm. maximum width, and .7 to .8 cm. in maximum thickness.

Two additional specimens that may be blanks for this form were found on Occupation Level I. The one illustrated (Fig. 67, *g*) lacks its extreme tip.

b) Large projectile points (Fig. 67, *e, f*). This type has a reconstructed length of 7 cm., 2.5 cm. maximum width, and 0.7 cm. thickness. Thirteen fragments and blanks of this type were almost evenly distributed between the two major occupation levels. In outline, these larger points are more parallel sided, although the butt is slightly contracted. In a specimen reported from the 1947 test excavation the contraction is even more marked (Schultz and Frankforter, 1948, Fig. 12: 7553). The crescent base is less well-developed than on the small points and may simply reflect the basal thinning technique.

In size and outline the small projectile points fall within the range of the major projectile point type described from Level I at Signal Butte (Strong, 1935, Pl. 25: 1, *o*, p. 233). An examination of private collections in the mountain and basin-plateau areas of the West shows a generalized type of crescent-based projectile point in wide and scattered distribution. This generalized type has been described from Deadman Cave near Salt Lake City (Smith, 1941, Pl. 2, A:1–8), and it is illustrated from the middle basin of the Columbia River (Krieger, 1928, Pl. 2: 4, 13).

The general affinities of the larger projectile points of the Frontier complex are also widespread. In outline and control of flaking our examples could suggest the recently delineated Plainview point (Sellards, Evans, Meade, and Krieger, 1947, especially Pls. 3: 1, 46; 4: 1), although the bases on the Frontier complex specimens are more contracted. Specimens more suggestive of the Frontier examples are illustrated from southern Montana (Mulloy, 1943, Fig. 20, C: 1–6), southern California (Amsden, 1937, Pl. 44, *b, d*), Missouri (Shippee, 1948, Pl. II, B, *a*; C, *h, i*), and South Dakota (Hughes, this vol., Fig. 69).

In the past authors have strained to postulate generic affinities of these types with Folsom and "Yuma," based primarily upon the use of a single criterion, general form. It is becoming generally recognized that the principal merit of such classifications as Folsom, Scottsbluff, and Eden, comes from the

utilization of an explicitly stated and relatively stable combination of criteria which includes such features as manufacturing techniques and surface treatment as well as specific details of form (Roberts, 1940; Wormington, 1948). We do not feel that we can define a sufficiently detailed combination of features on the basis of the Frontier culture complex projectile points at hand to warrant postulating any close

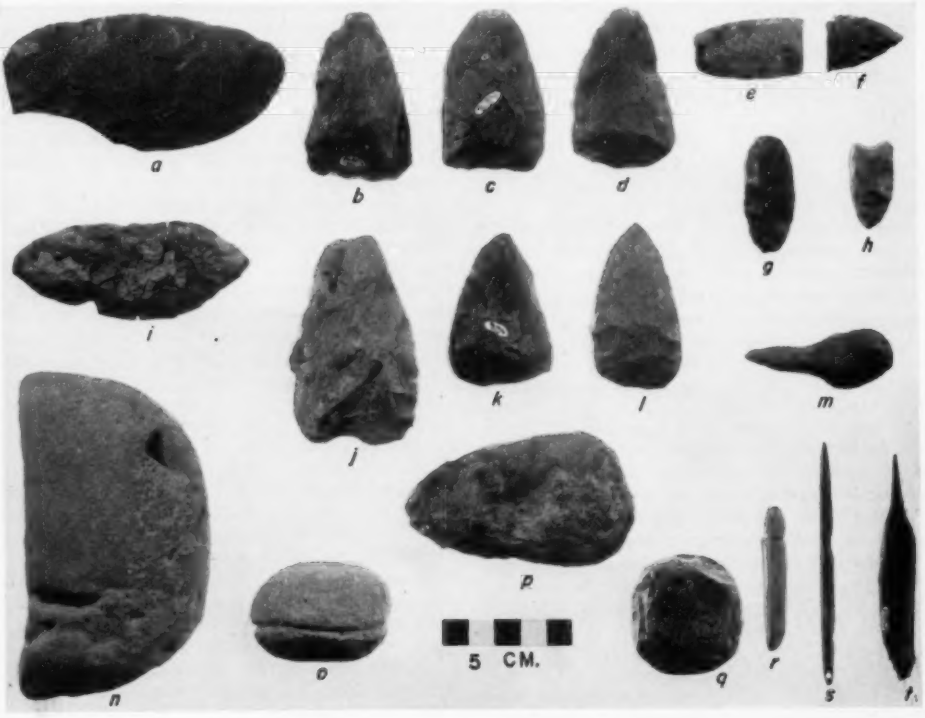


FIG. 67. Artifacts from the Allen site, Medicine Creek, Nebraska.

affinities, with the possible exception that the small points resemble the major type from Signal Butte I. Even in this case, further work must be done with stratigraphically placed specimens and further typological refinement be achieved before we can assume that the similarity is due to historical connections rather than independent, functional causes.

2. *Scrapers* (Fig. 67, *b–d*, *j–l*, *p*). The trapezoidal scraper is most characteristic of the Frontier complex and it occurs at the Allen site (Ft-50) to the virtual exclusion of the familiar plano-convex or thumbnail scrapers (see also Schultz and Frankforter, 1948, Fig. 13: 7577, 7578, 7579).

In outline these scrapers are roughly triangular to trapezoidal. The base is tapered to a point or sharply rounded butt, while the nose forms the base of the rough trapezoid, the scraping edge of which may be either in a straight line or slightly curved. The working edge may be confined to the nose, or either or both sides may be working surfaces in addition. These working edges have been thinned by the removal of flakes from both faces. Typically, the nose has been chamfered or given a bevel from one face. In all cases both faces have been worked by the removal of at least a few flakes.

The classical form is trapezoidal in total form. The base of many has been treated with considerable care to give a finished point (Fig. 67, *k*, *l*) or a rounded tip (Fig. 67, *b–d*), suggesting that either the tools were multi-purpose or they were designed for hafting. Cross sections, both lateral and longitudinal, range from ovate through lenticular to modified plano-convex. Dimensions vary from 7.75 cm. long by 4.33 cm. maximum width and 1.50 cm. thickness to 5.0 cm. long by 3.66 cm. maximum width and 1.0 cm. maximum thickness.

The general impression given by these scrapers is one of a core-tool in which the original cleavage faces

have been more or less obscured by later flaking and re-touching to final shape.

In five specimens (see Fig. 67, *b–d, l*) the nose chamfer has been modified by the removal of central flakes from the back of the tool toward the nose to give a trough-like quality so that the working edge of the nose curves downward. These troughed specimens seem to be rare in the ceramic complexes of the Central Plains area and they bear a striking resemblance to the Abilene type of core-scraper (Sayles, 1935, Pl. X, *a, b, c*) and the so-called Clear Fork "gouge" (Ray, 1938).

Two specimens more crudely made are considered a sub-type, notched trapezoidal scraper (Fig. 67, *j*). These may have served as shaft-scrapers or "spoke-shaves."

Another sub-type is trapezoidal only in outline (Fig. 67, *p*). They appear to have been made from a thin slab of flint; in cross section they are flat and all flaking is confined to the edges.

The vertical distribution of the principal types of scrapers may be significant. In Occupation Level I there were nine trapezoidal scrapers, three blanks for this form, one notched trapezoidal, and four flat trapezoidals; in the Intermediate Zone, two trapezoidal scrapers and one flat trapezoidal; in Occupation Level II, one trapezoidal scraper blank, one notched trapezoidal, and one flat. Although such a small sample is not amenable to statistical treatment it is also interesting that scrapers are the most abundant tool in Occupation Level I, constituting 35 per cent of the artifact inventory, whereas all scrapers fall down to 15 per cent in Occupation Level II, where blades and projectile points are present in an equal and higher percentage (23 per cent).

Comparable scraper types occur in the Central Plains on virtually all horizons (see for example, Wedel, 1935*b*, Pls. VII, *c, k*, VIII, *k;* Strong, 1935, Pl. 17: 2, *f, g, k, l*; Hill and Cooper, 1936, Pl. VII, *m–r*; Cooper, 1936, Pl. XVI: 1, 3, 4; Hill and Metcalfe, 1942, Pl. VIII: 2, *d*), but they are in a minority at the sites and the relative absence of other scraper forms may prove to be an interesting diagnostic of the Frontier complex.

3. Blades (Fig. 67, *a, i*). Two forms of blades or knives were present. One type, a thin ovoid blade (Fig. 67, *i*), was represented by a single specimen in Occupation Level II and a blank from Occupation Level I. Two similar specimens are reported from the 1947 test excavation (Schultz and Frankforter, 1948, Fig. 13: 7580, 7581). None of these can be distinguished from types found widespread in North America both spatially and temporally.

A more representative sampling of a larger, flat lanceolate blade (Fig. 67, *a*) was obtained, eight in Occupation Level I, five in the Intermediate Zone, and four in Occupation Level II. Their smaller size would differentiate them from the larger series reported from Ft-41 on Lime Creek, which range to lengths as great as 17.97 cm. (Schultz and Frankforter, 1948, p. 52, Fig. 8).

4. Drills (Fig. 67, *m*). Drills are of the common expanded base variety. There were three drills and four blanks, restricted to Occupation Level I with the exception of one specimen from Occupation Level II.

B. Ground Stone

1. Abrading stones (Fig. 67, *n*). Six fragments of sandstone and quartzite abrading stones were found. In at least three cases these are flat, ovoid, small (10–12 cm. diameter) grinding stones. The other fragments are too small to be reconstructed. The possibility of matched abrading stones is suggested on Occupation Level I. The fragments from the two lower levels exhibit fine striations of the sort that would result from use as awl hones. One specimen has a reddish stain in the center.

2. Bola weights (Fig. 67, *o*). A flattened spheroid of Niobrara chalk with a narrow equatorial groove was found in one of the windrows of bone on Occupation Level I. It has a polar diameter of 3.6 cm., an equatorial diameter of 5.0 cm.; the shallow equatorial groove (this specimen is more symmetrical than the plate would indicate) is 0.2 cm. wide with an expansion along 0.8 cm. of its length to a width of 0.4 cm. The specimen weighs 5.1 oz.

Comparable objects from other sites have been called "net-sinkers" (for example, Webb, 1939, pp. 33, 182, Pl. 14, *a*; Smith, 1941, Pl. VI, pp. 7–8, Fig. 4). In this case, since there have been no more than four fish bones so far identified from the Allen site (Ft-50) and since the material of the spheroid becomes soft when wet, a conservative judgment would be to identify the specimen as a bola weight.

Hibben describes and illustrates bola weights from Manzano Cave which are almost identical (Hibben, 1941, Pl. 14: 2, *a–d*, p. 36). In contrast, "net sinkers" from Deadman Cave (Smith, 1941), where no fish bones are reported, are ovoid like bola weights in Bird's Tierra del Fuegian series which includes spheroids resembling the Frontier specimen (Bird, 1938, Fig. 25; see also Bird, 1946, Pl. 10, *top, a*). Hibben mentions additional specimens of pear shape in his Manzano material.

3. Hammerstones (Fig. 67, *q*). Thirteen river pebbles of quartzite and flinty stone were found, only four of these in Occupation Level II. They showed characteristic battering and random spalling at the point of percussion.

II. BONE WORK

1. Needles (Fig. 67, *s*). Needles were represented by a single example from each occupation level defined. The one illustrated is flat and bodkin-like; the others were fragments of cylindrical needles (see Schultz and Frankforter, 1948, p. 54, Fig. 11: 7590).

2. Awls (Fig. 67, *t*). The awls of the Frontier com-

plex fall into two major categories common in other horizons on the Plains. Two fragments of splinter awls were found. The remaining forms (6 specimens; Fig. 67, *l*) were manufactured from split sections of cannon bone, from worked ribs, and a few from small, long-bone sections.

3. Fishhook. This slender bi-pointed object, 4.07 cm. long, is comparable to specimens from other horizons on the Great Plains which are used as straight fishhooks for hafting onto the familiar compound wood fishhook. A similar specimen is reported from the 1947 test excavation (Schultz and Frankforter, 1948, Fig. 11: 7588).

4. Miscellaneous bone work. The specimen of cut bone illustrated (Fig. 67, *r*) showed some polish on both faces, but it is unlikely that the encircling lines were for any purpose but cutting the bone. In general, the bone work at this site shows a greater variety and skill in manufacture than is exhibited in the flint industry. Both the awls and needles are finely made. It may be chance, therefore, that we found no bone beads and no examples of art work in bone.

We can summarize the elements of the Frontier culture complex as follows: a tool complex consisting of crescent-based projectile points, either small and leaf-shaped or larger with parallel sides and a slightly contracted base; trapezoidal scrapers with a tendency to curved bits; small spheroid bola weights of soft stone; knives in large lanceolate and thin ovoid shape; fine bone needles; small, flat grinding stones.

Any combination of a majority of these tool types in forms close to Frontier should be highly suggestive of historical connections, especially if these correspondences are strengthened by the addition of the other minor elements: straight fishhooks, split bone awls, expanded base drills, red hematite paint, and river-pebble hammerstones.

Other characteristics of the culture at the type site would include the fact that it is an intermittently occupied camp site with unprepared hearths and refuse in windrows containing large mammal bones and random cultural debris. At this locale there is a falling off in the intensity of settlement with a rather abrupt abandonment.

All of the above elements are interrelated functionally. For example, the relative absence of scrapers in the upper levels of the site is probably a reflection of the absence of bison remains and the general paucity of the artifacts. These in turn may be related to the relative preponderance of point fragments recovered and the nature of the midden and fireplaces: A smaller number of people were using the site for more and less successful hunting, with less stability of habitation. We cannot say whether or not this shift was a consequence of some change in the climatic conditions and the type of game available, but the geological studies which are being carried on at the site and in the general vicinity will undoubtedly be illuminating.

Even on the earlier level, where the site probably served more as a center of life—a place for preparation of foods, manufacture of bone and stone tools, preservation of hides, and sewing—the basic population unit was a very small group of semi-nomadic hunters. At this time, although the primary dependence was upon large game animals (from the surrounding uplands?), there was utilization of small mammals, birds, reptiles, amphibians, shell fish, insect grubs, and probably seeds and roots, for additional food.

Although we can see this change in the nature of the occupation of the site and although the total occupation may represent a long period of time the stability of the tool tradition would indicate that no significant cultural revolution had occurred. It is as though the reoccupation in Occupation Level II is an attenuation and fainter reflection of the original, more successful period of occupation, Occupation Level I. It must be emphasized that this pattern of occupation and final abandonment may have been simply the abandonment of the site as a bison hunting station and a concentration of hunting activity elsewhere in the region. Further data on the Frontier complex may give us some indication as to whether this pattern is localized or a widespread tendency reflecting major ecological shifts. Scanty test material from a Lime Creek site, Ft-42, would indicate that we may find another example of the Frontier culture complex in the immediate vicinity (Schultz and Frankforter, 1948).

We have noted in the opening sections of this paper that preliminary geological work has suggested considerable antiquity for the terrace remnant in which the Allen site (Ft-50) is buried. The archaeological evidence will not allow us to make specific statements regarding the exact chronological position of the Frontier culture complex as found in the Allen site (Ft-50). Lacking stratigraphic sequences in a field as little known as the Plains lithic horizons,

we feel that typological relationships to established horizons should be postulated with the greatest of care.

We have discussed the typological affinities of many specific elements of the Frontier complex. These comparisons are not a valid demonstration of historical connection. In a brief survey of pertinent literature we found only one site which may possess a group of elements which have a general similarity to the Frontier culture complex. At Deadman Cave in northeastern Utah (Smith, 1941), the following traits are shared with the Frontier complex: crescent-based projectile points, trapezoidal scrapers, ovoid blades, bola weights (our interpretation), bone needles, small flat grinding stones, split bone awls, and expanded-base drills. These traits, which form a considerable part of the complex at Deadman Cave, are scattered with other elements through three contiguous strata in the cave midden. A tentative geological dating, subject to revision, places these strata in a period extending from 4000 to 900 years ago.

In the absence of sites more closely related and conclusively dated, we must look to further research in geology and allied fields for any immediate answer to the exact temporal position of the Allen site (Ft-50). On the basis of archaeological research, the Frontier complex must be considered as "floating" chronologically somewhere in the considerable span of time occupied by the preceramic horizons of the Plains Archaic period. The exact delineation of this period and the historical details of the cultural relations within it will await further demonstration of such complexes as we have presented here.

INVESTIGATIONS IN WESTERN SOUTH DAKOTA AND NORTHEASTERN WYOMING

JACK T. HUGHES

INTRODUCTION

THE field work on which this report is based was carried out during the summer of 1948 by a field unit of the Missouri Valley Project, River Basin Surveys, Smithsonian Institution. The unit consisted of Mr. J. M. Shippee and myself; we were assisted during part of the time by Messrs. H. F. Wilson, S. J. Phelps, and R. F. Worden of Hot Springs, South Dakota. Investigations covered the four-month period from June 1 through September 29.

Five proposed reservoir sites in the Cheyenne Basin were investigated more or less intensively. All are Bureau of Reclamation projects, in various stages of development, located in or near the Black Hills of western South Dakota and northeastern Wyoming. Angostura Reservoir received much more thorough exploration than the others; work at this site forms the basis for the present report. Edgemont and Keyhole reservoirs are omitted because the data from them have not yet been evaluated. Pactola and Johnson Siding reservoirs, alternate projects, were unproductive and require no discussion.

The major objective of this report is to assemble in preliminary fashion the information so far at our command into a generalized picture of cultural events at a locality in the Black Hills from earliest times to the days of white settlement. This aim is carried out by identification and brief characterization of eight archaeological complexes recognizable at Angostura, and by examination of their cultural, spatial, and temporal relationships. A more detailed report is in preparation.

For help in the field, many thanks are due to Bureau of Reclamation personnel at Angostura and Keyhole, to Utah Construction Company personnel at Angostura, and to many nonprofessionals of the Black Hills region, all of whom aided in ways too numerous to mention. To the many people who have contributed directly and indirectly to preparation of this report, we also wish to express our appreciation.

ENVIRONMENTAL SETTING

The Black Hills region is of special interest to archaeology because of its unique character and strategic location. With its close juxtaposition of mountain, upland, and valley environments, each possessing its own particular natural advantages and each serving to complement and

supplement the others, the region doubtless played an unusually important role in shaping the cultural events which took place in and around it. And, as we might expect from its position between the typically Plains environment on the uplands to the west and the essentially Woodland environment in the valleys to the east, the region appears to have formed, in recent times at least, a sort of boundary between sedentary, horticultural, pottery-making peoples and nomadic, non-horticultural, non-pottery-making groups. For these reasons, the Black Hills region is an excellent laboratory for studying problems of culture and environment, and of acculturation.

Physiographically, the Black Hills are an isolated mountain range, surrounded by the Missouri Plateau (unglaciated) and situated just north of the High Plains. The so-called "hills" actually are a mountain range of classically regular structure. They are a deeply-eroded, oval-shaped, dome-like mass, approximately 100 miles long and 50 miles wide.

From the topographic, and hence climatic, floral, and faunal standpoints, the mountains present startling contrasts within themselves and to the surrounding territory. They are a kind of varied and fertile oasis in the midst of a relatively monotonous and poor country, affording water and shelter on every hand and unlimited vegetable, animal, and mineral resources. The Black Hills seem especially favorable for winter habitation, and historical sources confirm their importance as winter quarters for various Indian tribes in recent times. Canyons, cliffs, and caves afford protection from weather. Snows are reported to be lighter in the mountains than on the adjacent prairies. Spring-fed streams and lakes are numerous. Timber for fires, shelters, and other purposes is unlimited. Food plants, such as chokecherry, gooseberry, squawberry, buffaloberry, currant, wild rose, plum, grape, etc., grow at all except the highest elevations. Early ripening of these at low elevations and late ripening at high elevations produces, in effect, a longer gathering season than is found in areas of uniform elevation. The mountains once teemed with large animals such as elk, bighorn, bear, and bison; antelope, deer, small game animals, and wild fowl are still plentiful. Not to be overlooked are mineral resources, such as extensive deposits of quartzite and other materials of use to prehistoric inhabitants.

Contrasting with this environment and with each other are the valley and upland environments of the surrounding plateau. The uplands and valleys may be visualized as an interfingering of the western Plains environment with the eastern Woodland environment. Although water is not abundant on the uplands, blowouts and other depressions hold shallow pools for a short time after rains. There is little natural protection from the elements, and timber is non-existent. What the uplands lack in these respects, however, is more than made up for by their abundance of food plants, such as prickly pear, yucca, "Indian turnips," etc., and of game animals, such as the still-numerous antelope and the now-decimated bison.

Creek or river bottoms, with fertile soil and permanent water supply near at hand, were well adapted to primitive horticulture. Protection from weather is afforded by bluffs, and by groves of cottonwood, ash, and other trees, which also furnish material for fires, shelters, and other purposes; plant foods like those of the mountains are plentiful; deer, smaller game, and wild fowl, such as grouse, pheasant, prairie hen, quail, dove, duck, goose, etc., are numerous; fish, mussel, and other edibles are present in the larger streams; gravels in channels and on terraces are a convenient source of material for stone artifacts.

ETHNOLOGICAL BACKGROUND

Although ethnological information on the Black Hills region, until latest times at least, is based chiefly on linguistic affiliations, tribal traditions, and second-hand accounts rather than on eye-witness reports, ethnology may aid materially in interpreting the more recent archaeological manifestations of the region. Archaeological information, on the other hand, eventually may help in elucidating many obscurities in the ethnological picture. On the basis of ethnological clues, we may reconstruct in broadest outline the following picture of cultural events in the region from middle prehistoric through late prehistoric and protohistoric to historic times. (In the Black Hills region, for purposes of this paper, the late prehistoric period is assumed to have begun with introduction of the bow [*ca.* 1000 A.D.?], the protohistoric period with appearance of White trade goods [*ca.* 1700?], and the historic period with the explorations of Lewis and Clark [1804].)

The picture as outlined here may be far from the truth at many points, but there can be little

doubt of its major implication for archaeology: For a long time the region has been occupied by a number of different tribes representing various linguistic stocks, possessing different cultural traditions, and having diverse geographic connections.

In middle prehistoric times, the region probably was occupied by various nomadic tribes, some subsisting chiefly by hunting, others by gathering; it seems likely that some of these may have been affiliated with Athapaskan bands on the plains to the west, others with Caddoan groups in the valleys to the east.

In late prehistoric times, Athapaskan and Caddoan groups, the latter more or less transformed, may have lingered in the region, and Shoshonean and Siouan bands may have appeared. The Athapaskan Kiowa Apache with their allies, the Tanoan Kiowa, who they perhaps acquired in the Southwest, and possibly other Athapaskan hunters, may also have been there. Caddoan bands, at first with a thin veneer of horticultural traits acquired from Algonkian tribes to the east and later with these traits well developed, may have been present. (These possibilities are more fully explored in a paper now being prepared.) Towards the opening of the protohistoric period, the Comanche, and perhaps other Shoshonean gatherers, may have come into the region from the basins west of the Plains, while various Siouan horticulturists may have ranged in from the valleys to the east and north.

The protohistoric and historic periods, especially the latter, were characterized by a great increase in the scale and frequency of moves and contacts within the Great Plains, and by a corresponding acceleration of culture change, due mainly to the introduction of European ideas, such as use of the horse, and to direct and indirect pressures set up by white conquest.

Protohistoric times may have seen the abandonment of the Black Hills region by all Shoshoneans except the Comanche, and by all Athapaskans except the Kiowa Apache (and the allied Kiowa); Caddoan and Siouan inroads may have increased, as acquisition of horses enabled the horticulturists to extend their westward range. Caddoan visitors may have included the Pawnee and Arikara; Siouan visitors, the Omaha, Ponca, Mandan, Hidatsa, and Crow.

The Comanche, Kiowa Apache, and Kiowa appear to have abandoned the region in early historic times; soon thereafter it became the principal range of the Siouan Crow and Dakota, and of the Algonkian Cheyenne and Arapaho, nomadic hunters who shortly before had been sedentary horticulturists living far to the east and north.

ARCHAEOLOGICAL STATUS

The Black Hills are an especially promising field for archaeological investigation at present because of their position between the comparatively well-known valleys to the east and the practically unknown plains and basins to the west. Research in the region should do much to expand our knowledge of the peoples to the east by answering questions such as which groups ranged farthest up the river valleys, and what were the limits, times, causes, and effects of such extensions. Investigations here also should serve as a key to the unknown chronology of some of the later hunters and gatherers to the west by providing correlations with the known chronology of some of the recent horticulturists to the east.

Little scientific archaeology has been done in the Black Hills, and still less has been reported; most of the work reported is even more superficial than that on which this paper is based, and the publications are even less detailed than this one. Consequently, previous work in the region does little more than confirm the indications of environment and ethnology to the effect that the Black Hills possess a variety of aboriginal remains and present a number of archaeological problems.

References to manifestations within the Black Hills are to be found in Renaud (1936), Buker (1937), Over (1941), and Wedel (1947*b*). Renaud reports in some detail a rapid reconnaissance of the region; describes in summary form a number of sites, artifacts, and other evidence; but does not go far into the analysis, comparison, and interpretation necessary to give historical meaning to his discoveries. Buker presents a brief description of petroglyphs, pictographs, and other remains in Red Canyon near Edgemont, South Dakota. Over locates and illustrates several petroglyph and pictograph sites in the Black Hills. Wedel contributes a detailed description of a small collection of pottery from the vicinity of Sundance, Wyoming.

Except for a three-day reconnaissance of Angostura by a field unit of the Missouri Valley Project in 1946 (Bauxar, 1947), no work

had been previously done in any of the reservoirs investigated last summer. Reports of work in adjacent territory also are few and brief. Several writers, including most recently Schultz and Stout (1945, p. 244) and Champe (1946, pp. 63–5), discuss remains in terraces of the White River in northwestern Nebraska. Strong (1940, p. 387) reports a collection of pottery from the Badlands of South Dakota. Roberts (1943) mentions work at a bison kill in Agate Basin north of Lusk, Wyoming.

ANGOSTURA RESERVOIR

Angostura Reservoir lies at the southeastern edge of the Black Hills, on the Cheyenne River in Fall River County, South Dakota. The dam, a concrete and earth-fill structure, is 13 miles by road south of Hot Springs; it is under construction and should be completed in 1950. At maximum pool elevation of 3187 feet (m.s.l.), the reservoir will be about 11 miles long and 1½ miles wide. Purposes of Angostura Reservoir are power, flood control, and irrigation.

Locale

From the head of the future pool area, the river flows eastward for approximately seven miles, then flows northward for about four miles to the dam. The river runs through a canyon called Jackson Narrows near the upper end of the reservoir site, meanders across a broad terraced valley in the middle portion, and pours through another canyon called Angostura at the lower end.

Just above the dam, Sheps Canyon enters the river from the left and, not far above its mouth, is joined by Red Canyon from the left. Both tributaries are intermittent streams with high gradients and poorly developed terraces, heading in the mountains to the west.

Two major tributaries drain into the river from the right. Horsehead Creek enters from the southeast just below the river's northward bend, and Dry Creek from the south just below Jackson Narrows. Both tributaries are intermittent, meandering streams with low gradients and well-developed terraces, heading in the plains to the south.

The Cheyenne River is a typical western Great Plains stream, with moderate gradient and much seasonal variation in volume of water. Rock formations of the Angostura area dip in general across the direction of flow; as a consequence, long slopes rise toward the mountain tops to the north, while escarpments form the southern rim of the valley. Dakota sandstone is prominent on the slopes to the north, Pierre shale dominates the southern rim. Terrace development in the middle of the reservoir is excellent. Five major terraces are discernible. The highest terrace is represented by only a few isolated remnants. An 80-foot terrace forms large, mesa-like, boulder-strewn benches. A 40-foot terrace forms extensive flats. Twenty- and 10-foot terraces are narrow sandy belts below high-water mark. Forty- and 20-foot terraces are largely cultivated. Indian remains occur on top of the 80-foot terrace and both on and in the lower terraces. More investigation of these occurrences should result in correlations of value to both archaeologists and geologists.

Work

Three and a half months were available for work at Angostura. The reconnaissance begun in 1946 was completed within three weeks, and the rest of the period was devoted to testing some of the most important sites endangered by reservoir construction. To date, 71 sites have been recorded in Fall River County. All except five, located outside the reservoir area and recorded in 1946, have been visited. It is believed that most exposed sites in the future pool zone have been discovered; however, many promising sites remain to be tested, and several which have been tested require excavation.

Because of their nature, or because of inadequate exploration, many sites failed to yield diagnostic remains, and are not usable in this report. Workshop sites, petroglyph sites, etc., are among these; the report therefore does not indicate fully the variety of remains present at Angostura.

Results

Studies to date indicate that at least eight different foci are represented by components of the Angostura locality.[1] We will attempt to define, describe, correlate, delimit, and date each focus in supposed order of appearance.

Due to the present incomplete state of re-

[1] The words "focus" and "component" are used here in a rather special sense. Focus means an association of traits found at site after site, or found at one site and presumably present at others; component means the manifestation of a particular focus at a single site. A focus is visualized as the approximate archaeological equivalent of a tribe, a component as the occupation by a particular tribe of a single site.

search, it has been necessary to follow a more or less subjective procedure in the identification, characterization, and cultural, spatial, and temporal placement of the various foci. Although the more objective procedure to be used in completing current studies doubtless will modify and amplify the picture sketched here, it is believed that no major alterations will be necessary.

Hot Springs Focus

The existence of this focus is inferred chiefly on the basis of work at Site 39FA65, which we will call the Long site, after the owner of the farm where it is located.[2] This is an extensive occupational zone occurring under conditions indicative of considerable age and yielding projectile points indistinguishable from specimens which have been called "Oblique Yuma" (Wormington, 1944, p. 25). The site was subjected to careful examination, exploratory testing, and preliminary physiographic study (White and Hughes, MS). Although the Long site is one of the most interesting in the reservoir, its treatment here will be brief, since more work at the site is anticipated, and separate publication of the results is planned.

Identity and content. The Hot Springs Focus is identified principally by its distinctive projectile points. Traits so far referable to this focus are relatively numerous for an early culture, and further work at the Long site should add a great many more.

Camps. Brief, intermittent occupation of a long narrow belt along the base of a sheltering bluff, at the edge of a creek valley, is indicated.

Fireplaces. Fires appear to have been built on the surface in small circular areas. They seem to have been kept burning for some time, or to have been rekindled repeatedly on the same spot. No use of stones is evidenced.

Food. No bone has yet been found at the Long site; high gypsum content of the enveloping deposits perhaps led to complete decomposition of any bone that may have been present. Artifacts suggest heavy reliance on hunting.

Stonework. Most projectile points are of a type which will be referred to as the Long point (Fig. 68, *l–q*). These may be characterized briefly as large lanceolate specimens with narrow, straight to concave bases; fine, sometimes oblique flaking; and ground edges near bases. Other points include a specimen (Fig. 68, *r*) which has been identified by Mr. A. D. Krieger of the Department of Anthropology, University of Texas, as a rather large, crude Plainview point (Sellards, Evans, Meade, and Krieger, 1947, pp. 939–44), and one (Fig. 68, *s*) which resembles certain Pinto Basin points (Amsden, 1935, p. 42).

A kind of knife which will be referred to hereafter as the Badlands knife is represented. Badlands knives are common to all foci at Angostura; most are thin natural plates of wax-like chalcedony, unshaped, with one edge or opposite edges worked. A few are ovate in outline with all edges worked. Chalcedony plates from which these are made occur by the millions at certain outcrops in the Badlands.

Other artifacts include ordinary bifacial, percussion-flaked, ovate to round blades; small end scrapers; side scrapers; flake scrapers; and drills. One of the latter (Fig. 68, *t*) is a resharpened Long point with an unusual, convex base; the other is a tip fragment. An exceptionally interesting specimen is a fragmentary artifact resembling the distinctive gouges of the Clear Fork Focus (Kelley, 1947, p. 97).

A notable feature of the Long site is its great number of paper-thin flakes. This suggests unusually skillful chipping—an inference strengthened by the fact that most flakes are quartzite, which is generally conceded to be rather intractable.[3]

Other artifacts attributable to the Hot Springs Focus are a small pebble hammer; a large, thin, subrectangular mano of igneous material, with one grinding surface (the opposite face is decomposed); and several small fragments of sandstone and igneous rock, each with a bit of grinding surface. The last may be metate fragments.

Affiliations. Although detailed comparisons are yet to be made, the Hot Springs Focus is reminiscent of several known manifestations, and more or less close relationships with cultures both nearby and far away are indicated. Dr. Frank H. H. Roberts, Jr. of the Bureau of American Ethnology has kindly permitted inspection of several points closely resembling Long points from the Agate Basin bison kill not far west of Angostura in eastern Wyoming. Dr. C. B. Schultz of the Nebraska State Museum has shown me similar points from Hat Creek, the next major right-hand

[2] The only other manifestation referable to the Hot Springs Focus at Angostura is a projectile point found at a superficial, mixed, multi-component site.

[3] Quartzite is a common material not only in the Hot Springs Focus, but in most other Angostura foci as well. Most of this material appears to have been obtained from extensive quarries on Flint Hill, in the mountains some six miles (airline) northwest of the head of the reservoir site, or from smaller workings elsewhere in the mountains to the north, where outcrops of Dakota sandstone contain an abundance of gray, purple, red, brown, and yellow quartzite. The Flint Hill quarry is especially interesting. Scores of large crater-like pits and great quantities of rough workshop debris litter nearly a half section of land. Tipi rings and numerous other occupational remains are abundant in the vicinity. The magnitude of the site, together with the great number and variety of artifacts found there by its owner, Mr. Neal Conboy, indicates much use of the quarry by various groups from earliest times. Components of most foci found at Angostura probably are present, and others as well. Flint Hill seems to be fully as important a quarry as the better known Spanish Diggings of eastern Wyoming.

tributary of the Cheyenne River above the reservoir, and from a locality in the White River drainage not far south of Angostura. As mentioned above, Long points also resemble some of the so-called "Oblique Yuma" points from blowouts in northeastern Colorado.

Gouge-like artifacts similar to the fragment from the Long site were found at the Allen site, an early manifestation on Medicine Creek in Frontier County, Nebraska (Holder, 1948). Such artifacts were not found elsewhere during the two preceding seasons of field work by the Missouri Valley Project in Wyoming and Montana,[4] nor do they seem to have been reported anywhere else in the northern and western Great Plains. That they are extremely rare or altogether absent in late horizons of this region seems clear. Their occurrence at the Long and Allen sites suggests that they may have some value as early horizon markers, at least in the region under discussion; their similarity to the Clear Fork gouges of north and central Texas opens some intriguing questions. The same may be said for the association of a Plainview-like point and a Pinto-Basin-like point with the Long points.

Extent. Distribution of the postulated Hot Springs Focus, like that of other foci recognized at Angostura, will not be known until much more field work has been done. Present evidence suggests that the focus may be found to center somewhere near the northern edge of the High Plains, in northeastern Colorado, eastern Wyoming, western South Dakota, and western Nebraska.

Age. There is little doubt that the Hot Springs Focus is the oldest focus yet recognized at Angostura. Physiographic evidence shows that the Long site has a very respectable antiquity. Paleontological evidence, although absent at the Long site, is afforded by the closely allied Agate Basin site, where bison remains appear to be of modern species (Roberts, 1943 and conversation). Geologically speaking, we may postulate an early Recent age for the Hot Springs Focus; culturally speaking, an early prehistoric age.

What this means in terms of years is anybody's guess at the moment. My estimate, based on a correlation study now in preparation (Hughes, MS), would be *ca.* 4000 B.C. Radiochronological dating of charcoal from the Long site might solve the problem.

[4] Archaeological reconnaissance and survey of 10 reservoir sites in Wyoming and Montana during 1946 and 1947 is reported by Bliss and/or Hughes in 15 preliminary and supplementary appraisals prepared by Missouri Valley Project, River Basin Surveys, Smithsonian Institution for Missouri River Basin Recreation Survey, Region Two, National Park Service, and in other manuscripts on file at field headquarters of the Missouri Valley Project, Burnett Hall, University of Nebraska, Lincoln (excluding titles listed in the bibliography).

Cheyenne Falls Focus

Data on this focus were obtained through limited investigation of two components.

Identity and content. Components of the Cheyenne Falls Focus are differentiated from those of other foci mainly by their great abundance of manos and metates. Fewer traits are attributable to this focus than to most other Angostura foci.

Camps. Small camps, located along the edge of a high ridge or terrace near the river, are indicated. Camp sites appear to have been occupied for a considerable period, or to have been visited repeatedly.

Fireplaces. Fires were built on a cluster of stones. Condition of most hearths suggests constant or repeated use for some time.

Food. No bone scraps or food remains of any kind were found.[5] The numerous grinding implements may mean that some kind of plant food was important; the artifact inventory as a whole suggests emphasis on gathering rather than on hunting.

Stonework. Projectile points are uncommonly rare; only one example, a "fish-tailed" specimen, was found. In addition to the omnipresent Badlands knife, ordinary bifacial, pressure-flaked, ovate to subtriangular forms occur. Other stone artifacts include blades of various shapes; end, side, concave, and flake scrapers; and gravers. Pebble hammers occur. Manos are unshaped sandstone cobbles with single or double grinding surfaces. Metates are unshaped sandstone slabs with shallow, oval depressions, usually on one side only. One implement resembles those used by recent Indians for crushing cherry pits, etc.; this is a pecked sandstone artifact, thick and round, with bowl-shaped depressions in both faces.

Affiliations. Little can be said regarding cultural relationships of the Cheyenne Falls Focus. If it has been correctly placed in the sequence of Angostura foci, it can hardly be regarded as culturally continuous with the Hot Springs Focus. Work of the Missouri Valley Project in Wyoming and Montana has disclosed many sites with remains comparable to those of the Cheyenne Falls Focus, and relationships of some kind may be hypothesized. Similar manifestations do not seem to have been recognized elsewhere in surrounding territory.

Extent. The Cheyenne Falls Focus may be found to center somewhere in the basins of Wyoming or in adjacent portions of the Great Plains.

Age. Angostura investigations afford no satisfactory basis for relative dating of this focus. Both components are overlain by as much as a foot of eolian sand, and one is surmounted by tipi rings, but these circumstances obviously are not necessarily indica-

[5] Bone is more plentiful in silt than in sand deposits at Angostura, suggesting more rapid decomposition in the latter; both components of the Cheyenne Falls Focus are in sand deposits.

tive of any great age. Similar remains in Wyoming, however, have been found under conditions suggestive of considerable antiquity, for example, in rock shelters at the base of several feet of stratified natural and cultural debris. Generally speaking, therefore, we may assign the Cheyenne Falls Focus to a middle prehistoric period. If the focus is older than remaining Angostura foci, a date of over 1000 B.C. is indicated.

Jackson Narrows Focus

Surface examination and limited testing of four components provide knowledge of this focus.

Identity and content. The Jackson Narrows Focus is distinguished chiefly by projectile points of the kind described below. Not many traits are referable to this focus as yet, and few of these are diagnostic.

Camps. Temporary, intermittent occupation of small areas on creek and river terraces is indicated.

Fireplaces. Hearths are like those of the Cheyenne Falls Focus. Few show more than brief use.

Food. Bison seem to have been more important in the diet than antelope, deer, or other game. Mussels may have been a minor food. Artifacts suggest a primarily hunting, secondarily gathering subsistence.

Stonework. Projectile points include "fish-tailed" forms; a large, basically ovate form with concave base and deep side-notches; and a small, basically ovate form with base and corners shallowly notched. Also present are ovate to subtriangular knives, flake knives, and Badlands knives; blades of various shapes and sizes; choppers; end, side, and flake scrapers; and gravers. Disc-shaped, percussion-flaked hammerstones occur. An unshaped sandstone shaft smoother is present. Manos and metates like those of the Cheyenne Falls Focus occur infrequently.

Affiliations. The contrasting economies of the Cheyenne Falls and Jackson Narrows foci tend to argue against cultural continuity. Relationships of a general order, at least, over a broad territory outside the Angostura locality are suggested by similar points and other remains at a number of places: a site near Red Lodge, Montana (Mulloy, 1943); Pictograph Cave I near Billings, Montana (Mulloy, MS); various sites near the lower Yellowstone (Mulloy and Lewis, 1942); several sites in the Pryor Mountains of southern Montana (Nelson, 1943); Birdshead Cave, Complex B, near Shoshoni, Wyoming (Bliss and Hughes, MS); Signal Butte I-C[6] near Scottsbluff, Nebraska (Strong, 1935, pp. 224–39; Bliss, MS); the main component at Barn Butte[7] near Oshkosh, Nebraska; and many sites recently located in Wyoming and Montana. Comparable manifestations probably exist in the Dakotas, but they may not be as plentiful and have received little attention. Some or all of these manifestations probably pertain to the same general horizon, although important cultural, spatial, and temporal differences undoubtedly exist. The job of defining these differences will be difficult because of the non-diagnostic traits involved, the large territory covered, and the long time represented.

Extent. Distribution of this focus within the territory covered by the above manifestations can be determined only by additional field work.

Age. Placement of the Jackson Narrows Focus in the Angostura sequence is based on stratigraphic and comparative evidence. Components of both Jackson Narrows and Limestone Butte foci were found stratigraphically below components of the Sheps Canyon Focus. That the Jackson Narrows Focus is older than the Limestone Butte Focus is suggested by stratified sites such as Pictograph Cave, Birdshead Cave, and Signal Butte, where remains like those of the Jackson Narrows Focus occur below remains like those of the Limestone Butte Focus.

Present knowledge of components at Angostura is of little help in estimating the age of the Jackson Narrows Focus. All components are covered by deposits of eolian sand or fluviatile silt as much as two feet in depth, which, of course, may or may not be indicative of antiquity. Nearly all of the more or less distantly related manifestations noted above, however, occur under conditions suggesting considerable age. Like the Cheyenne Falls Focus, the Jackson Narrows Focus may be assigned to a middle prehistoric period.

Bliss (MS) has suggested a date of *ca.* 1000 B.C. for Signal Butte I-C. This agrees with my guess for the main component at Barn Butte, based on the correlation study mentioned earlier. Conditions under which components of the Jackson Narrows Focus occur at Angostura make even this estimate seem generous. Although Signal Butte 1-C and the main component at Barn Butte are quite similar, they resemble the Jackson Narrows Focus only in a general way, and some time difference would not be surprising.

Limestone Butte Focus

Knowledge of this focus rests on partial investigation of seven components.

Identity and content. The Limestone Butte Focus, although well differentiated from other foci, is closely allied to the Jackson Narrows Focus, being distinguishable from the latter mainly by its characteristic

[6] On the basis of a recent test, made in a different part of the site from that investigated by Strong, Bliss recognizes three levels in Signal Butte I, designated, from bottom to top, I-A, I-B, and I-C, and assigns lanceolate points to I-A, "fish-tailed" points to I-C.

[7] Barn Butte is a rich lithic site, extensively tested in 1939 by the late Perry Newell for the Nebraska State Historical Society Archaeological Survey, under the direction of Mr. A. T. Hill, who has kindly placed specimens and records at my disposal for purposes of a report which is currently being prepared for publication.

projectile points. The trait inventory resembles that of the Jackson Narrows Focus in kind and length.

Camps. Occupational areas are located in a variety of positions—butte tops, valley rims, valley slopes, and creek and river terraces. Moderately long occupation of a rather small area seems to have been the rule.

Fireplaces. Hearths resemble those of the Cheyenne Falls and Jackson Narrows foci. Some show slight use, others long or repeated use.

Food. In this respect, no differences are discernible between the Limestone Butte and Jackson Narrows foci.

Stonework. Large, corner-notched projectile points with expanding stems, straight to convex bases, and strong to barbed shoulders are typical. Also present are ovate to sub-triangular knives, flake knives, and Badlands knives; various blades; choppers; end, concave, and flake scrapers; and gravers. Pebble hammers and disc-shaped, percussion-flaked hammers occur. Flakes with much-worn edges are not infrequent. Manos and metates resembling those of the Cheyenne Falls and Jackson Narrows foci are rare.

Boatstones, uncommon in the north and west portions of the Great Plains, are represented by a single specimen. This artifact is composed of hard, grayish limestone. It is symmetrically shaped and smoothly finished; long, narrow, and oval in outline; and plano-convex in longitudinal and transverse cross section. A narrow, shallow groove encircles the convex side at the middle.

Burials. None were found at Angostura, but burials recently excavated near Scottsbluff, Nebraska by Mr. M. F. Kivett for the Laboratory of Anthropology, University of Nebraska, were accompanied by points and boatstones closely resembling those of the Limestone Butte Focus. This site, when reported, may throw some indirect light, at least, on burial practices of the Limestone Butte Focus.

Affiliations. Cultural continuity between the Jackson Narrows and Limestone Butte foci seems likely. Affiliations of the two with finds elsewhere appear to be of much the same order and distribution. Similarities, chiefly in point form, suggest close to distant relationship of the Limestone Butte Focus with a number of widespread manifestations: the Red Lodge site; Pictograph Cave II; lower Yellowstone sites; Pryor Mountain sites; Birdshead Cave, Complex B; Signal Butte II; the Scottsbluff burial site; certain Woodland components of Nebraska (Hill and Kivett, 1940, p. 170); and many sites in Wyoming and Montana.

Extent. Range of the focus within the region covered by related finds is yet to be determined.

Age. Placement of the Limestone Butte Focus in the Angostura sequence, as indicated in discussion of the age of the Jackson Narrows Focus, is supported by stratigraphic and comparative evidence.

Angostura components help little in dating the focus. Some have a considerable amount of overburden, others have none. Moderate antiquity is indicated by conditions under which most comparable manifestations occur. Like the Cheyenne Falls and Jackson Narrows foci, the Limestone Butte Focus is assignable to a middle prehistoric period.

The aforementioned correlation study suggests that Signal Butte II may not be much older than 1000 A.D. At Ash Hollow Cave near Lewellen, Nebraska, a Woodland component has been dated at *ca.* 1000–1150 A.D. on dendrochronological grounds (Champe, 1946, p. 57). Similarities in stonework between some of the lithic manifestations mentioned above and certain Woodland components tempt one to speculate that the latter represent originally lithic groups who acquired pottery from some source down the river valleys to the east, and that they may be approximately contemporaneous with the former. Most of the lithic manifestations probably are somewhat older than the Woodland components, however, so that a guess of *ca.* 500 A.D. seems reasonable for the Limestone Butte Focus.

Sheps Canyon Focus

Information on this focus was obtained by partial exploration of five components.

Identity and content. A distinctive form of hearth is the principal diagnostic trait. The trait list, although short, contrasts in several important respects with those of foregoing foci.

Camps. Located on creek or river terraces, or on river bluffs, these appear to have been of small size and short duration.

Dwellings. Some use of rock shelters is indicated.

Fireplaces. These are large, shallow, oval basins lined with rock. Most show signs of considerable use.

Food. Some use of antelope, deer, smaller game, and mussel is evidenced. Scarcity of faunal remains in and around the hearths suggests that they may have been used chiefly for roasting some kind of plant; lack of grinding implements, on the other hand, indicates that plant foods prepared by grinding were of little importance.

Stonework. Light, corner-notched points are characteristic. Small, ovate knives and Badlands knives; various blades; end, side, and flake scrapers; tiny T-shaped drills; points resharpened as gravers; pebble hammers; and unshaped sandstone shaft smoothers occur.

Pictographs. Finger-painted, pennant-shaped designs in red pigment on rock walls are perhaps attributable to the Sheps Canyon Focus.

Affiliations. Development of the Sheps Canyon Focus out of the Limestone Butte Focus, although possible, does not seem likely. The Sheps Canyon Focus does not appear to resemble closely any remains so far reported in surrounding regions. Although light, corner-notched points are common throughout surrounding areas, they do not seem to

have been reported in association with rock-lined, basin-shaped hearths. Similar points, and comparable hearths, occur at a few sites in Wyoming.

Extent. A limited distribution in western South Dakota and eastern Wyoming is suggested for the Sheps Canyon Focus.

Age. Position of this focus in the sequence at Angostura is relatively certain; components were found stratigraphically below those of the Red Canyon Focus and above those of the Jackson Narrows and Limestone Butte foci. The nature of the remains, conditions of preservation, and circumstances of occurrence at Angostura also indicate a late prehistoric age. If suggested dates for the earlier Limestone Butte and later Red Canyon foci are approximately correct, a date of *ca.* 1000 A.D. seems likely.

Camps. If the known component is typical, camps were small and located on low creek terraces. Intermittent occupation for brief intervals is suggested by an alternation of thin midden lenses and thin sterile lenses.

Dwellings. A possible pole hole was discovered during the last day of testing; pressure of other work unfortunately prevented search for a house floor.

Fireplaces. Fires were built on the surface and in small, shallow, circular depressions. Most fires appear to have been kept burning for some time. Scattered fragments of heat-fractured stones may have been used for boiling in hides.

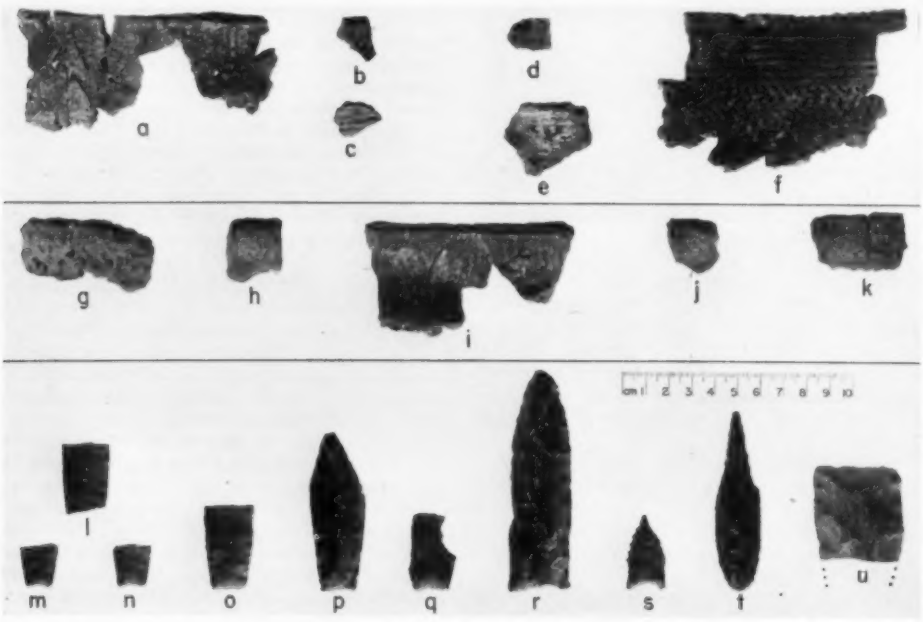


FIG. 68. Artifacts of three foci at Angostura Reservoir site, Fall River County, South Dakota: *a–f*, pottery of the Dry Creek Focus (*a–c*, Site 39FA48; *d–f*, Site 39FA45); *g–k*, pottery of the Horsehead Creek Focus (Site 39FA23); *l–u*, stonework of the Hot Springs Focus (Site 39FA65).

Horsehead Creek Focus

Existence of this focus is postulated on the basis of exploratory tests at a single component.

Identity and contents. The characteristic pottery of the Horsehead Creek Focus serves to distinguish it from other Angostura foci. Although known from only one component, this focus has a longer trait list than earlier foci. Tests were relatively extensive, and, as is usually the case with pottery sites, remains were comparatively plentiful.

Food. Antelope and deer bones are plentiful, bison bones scarce. A few chokecherry pits and mussel shells are present. Pottery suggests horticulture.

Pottery (Fig. 68, *g–k*). A good sample of sherds was recovered. Paste consists of slightly gritty clay with sizeable amounts of sand temper; the latter reminds one of the coarse, rounded, well-sorted sand present on anthills in the vicinity.[8] Vessels appear to have been middle-sized and olla-shaped, with short expanding necks, wide sloping shoulders, and, probably, full rounded bodies. Pots were moderately

[8] A similar observation has been made by Buker (1937) regarding temper of sherds in Red Canyon.

heavy, with thin walls toward bases, thick walls toward necks. The paddle and anvil technique was used in construction. Sherds possess light to heavy impressions produced by cord-wrapped paddles. Impressions are approximately vertical, at least on necks and shoulders. Cord marks are partly smoothed over in some cases. Decoration, when present, is confined to lips. These are flattened; one is cord-marked, the rest are smoothed. Some of the latter are decorated with several kinds of diagonal impressions. Firing seems to have been done by a reducing method which failed to prevent a certain amount of oxidation. Wall cores and surfaces are black with occasional reddish areas. Use of some vessels for cooking is indicated by carbon film on a few sherds.

Stonework. Most projectile points are small and triangular; some are plain, some are side-notched, and one is side-and-base-notched. Two heavy, corner-notched specimens represent a minor type. Several ovate to sub-triangular knives, flake knives, and Badlands knives; a few blades; numerous end scrapers and a few side, concave, and flake scrapers; a T-shaped drill; and pebble hammers are present. An unshaped sandstone shaft smoother and a sandstone pebble with worn edge complete the inventory of stonework.

Bonework. A burnt fragment of a large bone awl was found.

Affiliations. Pottery indicates that the Horsehead Creek Focus belongs to the Upper Republican Aspect. To which of the various known foci (Wedel, 1934*a*) of the Upper Republican Aspect the Horsehead Creek Focus is most closely allied cannot be determined until more information about the latter has been obtained. However, both braced and unbraced rims are found in all known Upper Republican components, and if further investigation of the Horsehead Creek Focus fails to reveal braced rims, this lack would set the Horsehead Creek Focus off rather sharply from other Upper Republican foci. On theoretical, typological grounds, one is tempted to speculate that components lacking the braced rim will be found, that these components may prove to be earlier than those with both rim forms, and that the site on Horsehead Creek may turn out to be such a component.

Extent. The Horsehead Creek site seems to be the most northwesterly Upper Republican component known to date.[9] The postulated Horsehead Creek Focus might be expected to center somewhere to the south and east.

Age. On the basis of Angostura work alone, the Horsehead Creek Focus could not be placed in the sequence of foci, since the single component did not occur in stratigraphic relationship to those of other foci; nor could its relative age be indicated more specifically than by assigning it to a late prehistoric period. However, Upper Republican occupations at Ash Hollow Cave have been dated by means of dendrochronology at *ca.* 1300–1500 A.D. (Champe, 1946, p. 85), and if a similar date is assumed for the Horsehead Creek Focus, it would appear to follow the Sheps Canyon Focus.

[9] Unless the cord-marked pottery mentioned by Buker (1937) represents Upper Republican components.

Red Canyon Focus

Recognition of this focus is based on examination and testing of five components.

Identity and content. Components of the Red Canyon Focus are characterized principally by roasting pits of the kind described below. The trait list, although longer than those of earlier lithic foci, still leaves much to be desired.

Camps. Very small camps located on slopes or terraces near creeks or rivers appear to have been the rule. Extended occupation of some sites is evidenced.

Fireplaces. The average roasting pit is about 2 feet in diameter by 3 feet in depth. The bottom one-third is filled with charcoal and fire-fractured stones, the top two-thirds with sooty soil. The wall is hardened and reddened by intense heat. Thin layers of clean sand near the bottoms of some pits suggest that they were used repeatedly.

Food. Faunal remains are not plentiful. Bones of small animals are present; those of bison, antelope, and deer are rare. This suggests that the pits may have been used mainly for roasting plants. The artifact inventory also hints at reliance on plants and small game.

Stonework. The following chipped stone artifacts occur: small, triangular, side-notched projectile points; Badlands knives; small, ovate blades; end, side, and flake scrapers. A sandstone fragment with worn edge is present. Although metates resemble those associated with earlier lithic foci, manos are quite different, being long, two-handed implements.

Bonework. Awls, large tubular beads, and small tubular bird-bone beads occur.

Burials. Occasional use of roasting pits as graves is indicated by a site above the reservoir area, where human skeletal remains, bone awls, and tubular bone beads were reported to have been found in one of several pits encountered by Mr. Kenneth Helsel, of Edgemont, while excavating a cellar. Manos and metates also were reported to have been found. Inspection of specimens still in possession of the discoverer, and limited tests at the site, tended to confirm the reports.

Affiliations. The Red Canyon Focus may be related in some way to the Sheps Canyon Focus, but does not seem to be affiliated with other Angostura foci. Complex B at Birdshead Cave is characterized by pits resembling those of the Red Canyon Focus, but somewhat smaller and shallower. At Birdshead Cave, the pits are associated with heavy points, and appear to be middle prehistoric in age. Pits like those of Complex B also occur at many sites in the region of Birdshead Cave. Pits quite similar to those

of the Red Canyon Focus have been found at sites near Glendo in southeastern Wyoming. Components of the Dismal River Aspect, in western Kansas and Nebraska, possess somewhat similar pits (Wedel, 1940*a*; Hill and Metcalf, 1942, p. 177). The Dismal River Aspect, with small triangular points, Southwestern-like pottery, and white trade goods, appears to be late prehistoric and protohistoric in age, *ca.* 1600–1750 (Wedel, 1947*a*, p. 152).

It has been suggested earlier that the region covered by the above manifestations was inhabited in late prehistoric and protohistoric times by the Comanche, relative newcomers from the basins, and by the Kiowa Apache and Kiowa, comparative natives of the Plains. These circumstances suggest the following theory: introduction of roasting pits, without pottery, into the Plains by late prehistoric spread of the Comanche from the basins; acquisition by the Kiowa Apache and Kiowa of the roasting pit idea from the Comanche, and of the pottery idea from the Southwest, during wanderings along the "Old North Trail" in late prehistoric and protohistoric times. Thus the Red Canyon Focus may be Comanche, while the Dismal River Aspect may be Kiowa Apache and Kiowa.

Extent. It seems likely that the Red Canyon Focus may be found to extend over parts of eastern Wyoming, western South Dakota, and western Nebraska.

Age. That the Red Canyon Focus succeeded the Sheps Canyon Focus is known from the occurrence of a component of the former stratigraphically above a component of the latter. That it also succeeded the Horsehead Creek Focus is suggested by the recent look of all remains of the Red Canyon Focus at Angostura, and by similarities between the Red Canyon Focus and the Dismal River Aspect. The absence of white trade goods, however, indicates that the Red Canyon Focus is late prehistoric rather than protohistoric in age. A date of *ca.* 1600 A.D. seems probable.

Dry Creek Focus

Exploratory tests at two components provided data on the Dry Creek Focus.

Identity and contents. Identification of this focus rests mainly on its characteristic pottery. Since tests were not extensive, the trait list is rather short for a pottery culture.

Camps. Occupational remains are spottily distributed over a broad expanse of creek or river terrace. Brief occupations by large groups seem indicated.

Food. Remains of bison, antelope, deer, smaller game, and mussel are present in small quantities. Pottery may signify horticulture.

Pottery (Fig. 68, *a–f*). Minor differences between the sherd collections from the two components are discernible, but these are overshadowed by general and specific similarities, and may be ignored for present purposes. Clay is fine; temper, generally rather sparse, usually consists of large angular particles of crushed quartz, frequently of tiny thin flecks of pulverized bone, and occasionally of both. Most vessels seem to have been small and olla-shaped, with short vertical to expanding necks, wide sloping shoulders, and, probably, full rounded bodies. Vessels were unusually light, with extremely thin walls toward bases and only slightly thicker walls toward necks. As a result, most sherds are extremely small. Construction was by the paddle and anvil process. Undecorated portions of exterior surfaces often possess faint corrugations produced by grooved paddles. Corrugations are approximately vertical, at least on necks and shoulders. Most vessels seem to have been decorated. In some cases, decoration is limited to deep diagonal or herringbone impressions on flattened lips. This decoration often is supplemented by rectilinear designs incised on necks, shoulders, or both. Necks usually are encircled by horizontal parallel lines, sometimes by diagonal sets of parallel lines. Opposed diagonal sets of parallel lines occur commonly on shoulders. Large triangles separated by diagonal parallel lines and filled with zigzags and punctates occur on the shoulder of one vessel; the neck of the same vessel is encircled by horizontal parallel lines; and the lip has herringbone impressions. Firing usually produced more oxidation than reduction. Some sherds are dark throughout, but most have light surfaces and dark cores, and many are light throughout. Interior surfaces of many sherds have a bright red wash. Cooking vessels probably are represented by a number of soot-covered sherds.

Stonework. The following chipped stone artifacts are present: small, triangular, side-notched projectile points; ovate to sub-triangular knives, flake knives, and Badlands knives; a fragment apparently representing a beveled, lozenge-shaped knife of the so-called "Harahey" class; various blades; choppers; numerous end scrapers, some side, concave, and flake scrapers; and gravers. Flint Hill quartzite is even more common than in most Angostura foci. Pebble hammers occur. Flakes with much-worn edges are present. Ground stone artifacts include: a small fragment of polished igneous rock apparently chipped from a celt or ax; unshaped sandstone shaft smoothers; unshaped sandstone grooved abraders; a sub-cubular sandstone pebble with grinding surface at one end; and a disc-like sandstone pebble with notched edges.

Affiliations. The Dry Creek Focus evidently is unrelated to other Angostura foci. Pottery more or less closely allied to that of the Dry Creek Focus, although not yet widely reported, has been found at many sites over a wide territory. Incised pottery mentioned by Buker (1937) may be similar. In a recent paper by Wedel (1947*b*), nearly identical pottery from a site near Sundance in northeastern

Wyoming is described, and several sites in northern Nebraska with similar pottery are mentioned. Comparable sherds were recently collected at four sites in the proposed Ericson Reservoir on the Cedar River in Greeley County, Nebraska, and at a site in the proposed Mullen Reservoir on the Middle Loup River in Hooker County, Nebraska (Kivett and Hughes, 1947, pp. 19–22, 29). Similar material was found at a site in the proposed Harlan County Reservoir, on Prairie Dog Creek, in Nebraska (Kivett, 1947, p. 8). Collections of the Laboratory of Anthropology of the University of Nebraska contain similar pottery from three sites in Knox County and two in Holt County, Nebraska. Both Laboratory of Anthropology collections and Nebraska State Historical Society collections may contain similar remains from other sites; a thorough search for comparable materials has not yet been made. Mr. P. L. Cooper of the Missouri Valley Project indicates (personal communication) that pottery of a similar kind occurs along the Missouri River at least as far north as the mouth of the Cheyenne River.

It has not been possible to compare in detail the pottery of all these manifestations. One would expect to find important areal and temporal differences over such a wide region. On the whole, however, it is readily distinguishable from pottery of better known cultures in Nebraska. Loosely speaking, we may say that it has a "Siouan" or "Middle Mississippian" look, since it resembles in a general way the pottery of cultures with these affiliations.

That the pottery is recent, perhaps late prehistoric to early protohistoric in age, has been suggested by Wedel (1947*b*). All indications tend to support this view. One of the components at Angostura produced few flakes, few stone artifacts, and no projectile points, suggesting protohistoric occupation, although white trade goods were not found. The artifacts of the other component indicate late prehistoric occupation.

The Ponca and Omaha are known to have been the principal inhabitants at *ca.* 1700 A.D. of the eastern portion of the region covered by the manifestations noted above (Bauxar, MS). This circumstance, together with the evidence just reviewed, suggests that many of these manifestations may represent late prehistoric and protohistoric Ponca and/or Omaha occupations.

Extent. That there may be focal differences within the region containing pottery like that of the Dry Creek Focus seems probable. What the extent of the Dry Creek Focus may be is a matter of speculation at present. That it may extend some distance to the northwest is indicated by the Sundance find; its main range may be towards the east and southeast, but components might be expected to occur somewhat farther to the west as well.

Age. The Dry Creek Focus has been placed at the end of the Angostura sequence chiefly on the basis of comparative evidence, since neither component occurred in stratigraphic relationship to components of other Angostura foci. The age of these components is indicated only by their artifact inventories, suggestive of late prehistoric in one case and protohistoric in the other. A date of *ca.* 1700 A.D. may be postulated for the Dry Creek Focus.

Tipi Rings

These features, which are common sights in the northern and western Great Plains, were found at five locations in the Angostura area, and reportedly occur at many other places in the vicinity. At Angostura, as at most localities throughout the Plains, the groups of stone circles seldom are accompanied by more than a few flakes and cores.

The role of these features in Great Plains archaeology is a problem that is crying for attention. Investigations will be considerably hampered by the frequent paucity of artifacts and other remains; however, the task does not appear to be hopeless, and sequential arrangement of the sites may ultimately prove feasible.

CONCLUSIONS

The foregoing discussion makes one fact abundantly clear: in the Great Plains province, temporally late, spatially eastward, and culturally rich horizons are best known, while temporally early, spatially westward, and culturally poor horizons are poorest known. Where our efforts should be concentrated is obvious.

The non-diagnostic nature of most artifacts of non-pottery horizons makes large samples indispensable; yet these are the very horizons in which artifacts are most apt to be scarce, scattered, and deeply buried. Thus, in most cases, the amount of information recovered is directly proportional to the amount of overburden removed.

Clearly, in the present race against time, our greatest need is for larger excavation crews and more earth-moving machinery.

River Basin Surveys
Burnett Hall
University of Nebraska
Lincoln, Nebraska

ARCHAEOLOGICAL INVESTIGATIONS IN MEDICINE CREEK RESERVOIR, NEBRASKA

MARVIN F. KIVETT

THE Medicine Creek Valley of south-central Nebraska has for many years been known to contain within its limits important archaeological materials representing various periods of man's occupancy in the Central Plains. The region is climatically near the western limits of successful general farming. While the yearly precipitation averages about 23 inches, records show a variation in total from 11 to 38 inches. (Bason and others, 1939, pp. 4–6). This wide fluctuation in precipitation, often combined with extremely high temperatures during the growing season, makes the area one of agricultural uncertainty. Early White settlement in the valley was often retarded and in some instances completely checked as a result of severe but usually short-period droughts. Prehistoric horticultural groups subsisting in this region were undoubtedly subjected to the same unfavorable conditions. They, like the early White settlers who were to follow, may have been forced at times to abandon the area temporarily and withdraw to a more favorable one. Or perhaps they, like the Whites, eventually adjusted their farming or gardening practices to local conditions and were able to maintain their subsistence during drought periods by a greater dependency upon hunting, an increased storage of foodstuffs, or possibly the adoption or development of more drought-resistant crops.

Within historic times there were no permanent aboriginal villages in the immediate vicinity of Medicine Creek. The Pawnee, however, hunted over much of the area and during the early nineteenth century occupied a large earth-lodge village on the Republican River less than 100 miles to the east. Further to the east and north were other sedentary horticultural groups such as the Omaha, Ponca, and Oto. To the north and west of the Medicine Creek area were the more nomadic peoples including the Comanche, Arapaho, Cheyenne, and Teton Dakota, who were dependent largely on the results of the chase. Thus, during the historic period, the Medicine Creek Valley lay in that area of borderland between the horticultural groups to the east and the hunters of the west.

Previous work in the Medicine Creek Valley includes excavations by the Nebraska State Historical Society during the summers of 1933 and 1934 (Wedel, 1934*b*, 1935*b*). These investigations at four sites near the present upper limits of the Medicine Creek Reservoir resulted in the excavation of seven house floors with associated materials attributable to a variant of the Upper Republican Aspect. Archaeological attention was again directed toward a portion of the area during the summer of 1946 when River Basin Surveys personnel made a brief preliminary reconnaissance of the proposed Medicine Creek Reservoir. Some 14 archaeological sites were located as a result of this brief investigation and recommendations were made for the excavation of several. During the summer of 1947 the Nebraska State Historical Society, a cooperating agency, and the River Basin Surveys conducted an intensive survey in the reservoir, including the excavation of seven house floors in four village sites assignable to the Upper Republican Aspect.

In March, 1948, through a cooperative agreement with the Bureau of Reclamation and the National Park Service, the Smithsonian Institution began large scale excavations in the reservoir area.[1] With construction work for the dam already under way, attention was first directed toward two village sites (25FT16, 25FT17) on the west dam axis which were shortly to be destroyed (Fig. 69, A). One large village site (25FT13) lying within a proposed borrow area just above the east dam axis was also in danger of destruction. Upon the completion of excavations in these three areas, investigations were continued along the west bank of the stream to the mouth of Lime Creek slightly less than two miles above the dam site. A total of 28 house floors, more than 20 midden areas, and various other features, including storage pits and burials, were excavated during the summer by the River Basin Surveys in six Upper Republican village sites. In addition,

[1] Grateful acknowledgment must be made here for the assistance and excellent cooperation extended by the Bureau of Reclamation, its officials, and various employees. We desire especially to express our thanks to Mr. Avery A. Batson, Regional Director; Mr. H. E. Robinson, District Manager; and Mr. C. L. Mutch, Construction Engineer.

two small village areas apparently attributable to a single variant of the Woodland pattern were completely excavated.

Two cooperating agencies, the Nebraska State Historical Society and the University of Nebraska State Museum, also conducted excavations within the reservoir. The work of the Historical Society was, for the most part, directed toward the excavation of 14 earth-lodge floors in six Upper Republican village sites near and above the mouth of Lime Creek. The work of the University of Nebraska State Museum involved chiefly an early lithic site, which is the subject of another paper in this issue (pp. 260–6).

Most village sites in the area, when not subjected to intensive cultivation or erosion, are overlain by a sterile windblown soil deposit varying from 6 to 18 inches in thickness. Beneath this deposit occurred the village level, a dark cultural zone from 6 to 20 inches in thickness. Power machinery, consisting of a small bulldozer and road patrol, was utilized primarily for the removal of the sterile overburden, cutting exploratory test trenches, and disposing of refuse earth. Careful dissection and removal of the dark cultural zone, mainly by hand labor, revealed the various village features such as house floors, storage pits, and midden areas.

UPPER REPUBLICAN SITES

Upper Republican sites in this area are situated on terraces of variable size which rise from 20 to 40 feet above the floodplains. Erosion and cultivation have modified some of the terraces to produce a somewhat rugged terrain but the majority, when grass covered, are flat and level. Some evidence of aboriginal occupancy can be found on virtually every suitable terrace. It is very difficult in some cases to determine the exact boundaries between sites and a cultural analysis of the material from the various features will be necessary before the limits can be accurately estimated. There was no evidence of fortification or attempt at concealment for the villages.

House sites were generally grouped in clusters of two to four structures with a considerable distance often separating the groups. The house floors had been excavated, in some cases, to a depth of 6 to 20 inches below the general village level. In other instances the house had been constructed on or only slightly below the old ground surface. The floors as outlined by the post molds were in all cases rectanguloid in form. Scattered midden areas were usually present at the end and around either side of the entranceway. At one site the occupants of three houses appear to have shared a common midden. In a few instances debris may have been disposed of by dumping it over the steep terrace front.

A limited number of outside storage pits were found near the entrances and beneath the midden areas but they were more commonly located beneath the house floors. Storage pits were much smaller than those generally found in later villages of such sedentary horticultural groups as the Pawnee. The maximum depth was usually 4 to 5 feet with a somewhat greater diameter at the base than at the top. These were used for the storage of corn, beans, sunflower seeds, and other foodstuff. When no longer suitable for such purposes they were utilized for the disposal of refuse. The most common type of refuse filling many of these pits at Medicine Creek was mussel shells which occurred in large quantities throughout the sites.

The entranceways ranged from 8 to 10 feet in length and 2 to 4 feet in width and usually extended outward from a point near the middle of one wall. Most of the entranceways opened to the south, although there were entrances to the east, southeast, and southwest as well. The floor of the entrance was, in most cases, constructed on the same general level as the house floor. In two structures, however, the floor of the entrance had been excavated to a depth of 12 to 24 inches below the general floor level, probably to facilitate drainage.

A single central fireplace was most common. One long rectangular house floor, however, departed from the usual pattern in having two fireplaces, near the center in either half of the floor area. The entranceway extended from near the midpoint of one long wall.

The house floors were not burned or puddled before use as in many historic village sites but were only leveled. The fireplaces were well marked by a shallow unlined basin generally filled with white ash and burnt earth 6 to 12 inches below the general floor level. Central supports for the structures included most commonly four and occasionally six large posts set at approximately equal distance from the fireplace. The outer post molds marking the walls of the houses were smaller in diameter and were more closely spaced. Rafters presumably extended from the smoke hole above the fireplace

to the outer walls. A covering of brush, grass, and then sod appears to have completed the roof. Short vertically placed poles may have rested on the ground to close in the outer walls. Of this, however, there was no direct evidence and it is equally likely that interwoven willows and grass may have enclosed the walls.

Middens were in most cases situated close to the houses, usually occurring near the entrance; they were generally rather thin and scattered. Their depth seldom exceeded 12 to 16 inches and there were no surface elevations to mark their presence such as is common at many later sites in the Plains area. In several instances cultivation and erosion had actively reduced the debris but in many cases the midden had been preserved by the sterile overlying windblown deposit.

Specimens from the various sites number more than 30,000 and include large amounts of pottery, objects of stone, bone, shell, and various vegetal materials. The pottery from the Upper Republican sites include several thousand body sherds, hundreds of rim sherds, two small complete vessels, and perhaps 25 restorable vessels. They include large full-bodied vessels measuring up to 40 cm. in diameter, a limited number of bowls, and some miniatures. Handles, lugs, and similar appendages were not found. The bulk of the ware is medium to dark gray in color but some of the more highly fired sherds are buff to red in color. The majority of the sherds are moderately tempered with fine sand but in others the tempering is very coarse. A very minor number were tempered with finely crushed shell. The exteriors of the vessels have been roughened with a cord-wrapped paddle. The impressions on many have been partly smoothed while still moist to produce a slight degree of polish. Impressions are often in a vertical pattern but in other instances may be horizontal or even criss-cross, particularly near the rounding base of the vessels. Interior surfaces are commonly smooth but some striae may be present from the use of a smoothing tool. While considerable variation occurs in the thickness of the sherds, the bulk are from 4 to 6 mm.

Rim shapes are of two general types. The most common rim is a collard or thickened form with which several geometric patterns of incised lines are most commonly associated (Fig. 69, B). The second type is a simple direct unthickened rim which may curve, flare, or rise nearly vertically. This type is rarely decorated except for the occasional occurrence of small diagonal incised elements on the lip. A limited number of sherds, some of which are from rather deep bowls, have a bright red stain on the inner surface which does not rub off easily (Fig. 69, B).

The bulk of the stone specimens are fashioned from a variety of brown to yellow jasper obtainable from nearby outcroppings; local exposures of chalk and sandstone were also utilized for artifacts. Chalcedony, moss agate, cairngorm, amazonite, and obsidian had a very limited use.

Artifacts of stone are generally well made and consist of numerous forms. They include well worked triangular projectile points, usually side-notched; diamond-shaped, four-bladed knives; thin ovoid blades; side and end scrapers; several types of drills, including a T-form; chipped celts or axes; various types of sandstone abraders; stream pebble pecking stones; polished celts; stone pipe bowls, on many of which various animal forms have been incised; carved human heads and faces; mealing and grinding slabs; and small stone pendants. Hematite, limonite, and various colored chalks were apparently used for paint.

Objects of bone and antler include scapula hoes, various types of awls, eyed needles, fishhooks, slotted knife handles, shaft wrenches, perforated toe bones, antler clubs, antler cylinders, ulna picks, bison spine beamers, and deer mandibles well polished on the broken or worn diastema.

Specimens of worked shell were rare; they include perforated clawlike pendants, disk beads, and olivella shell beads.

Conditions of preservation were particularly good at most of the sites and many sizable wood sections came from some of the post molds. Although all of the wood has not been identified, considerable juniper and elm are represented. Charred corn kernels were plentiful at all of the sites and some short cobs bearing 6 to 12 rows of kernels were found. Other

EXPLANATION OF FIG. 69. A, Upper Republican site on west dam axis: *lower right*, three house floors with associated middens; *upper center*, two house floors. B, Upper Republican specimens: *left*, restored vessels; *right*, various artifacts (not to scale). C, specimens from two Woodland sites.

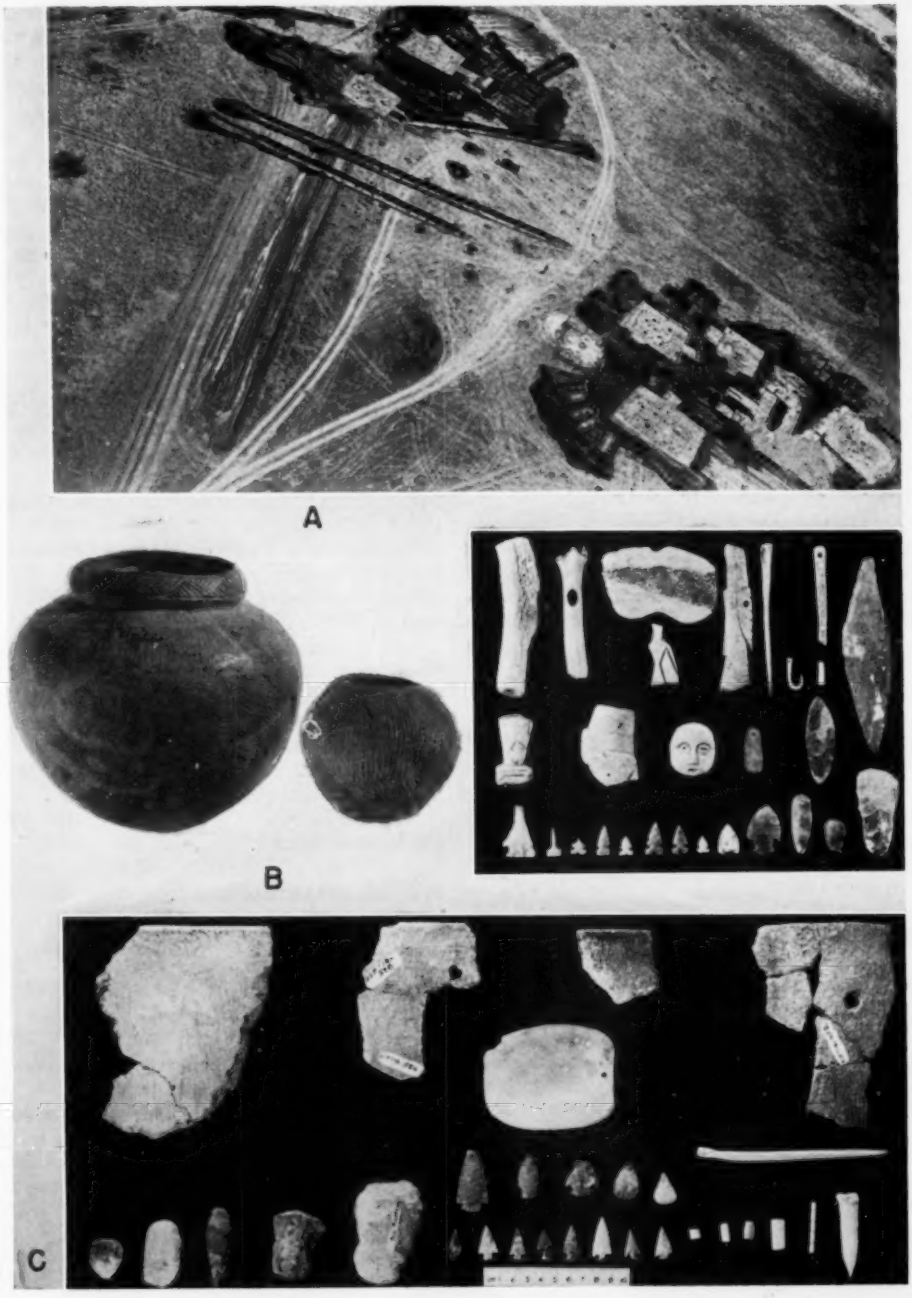


FIG. 69. Excavations and artifacts, Medicine Creek Reservoir, Nebraska. (See facing page for explanation.)

charred vegetal materials include sunflower seeds, charred nuts, and squash or melon seeds. No basketry, cordage, twisted fiber, or similar materials were recovered.

Although scattered human bones were occasionally found in the houses, storage pits, and middens, only one articulated skeleton probably attributable to the Upper Republican peoples was found. This was a single adult male buried in an extended position in the flesh. The remains were found on top of a high hill overlooking village site 25FT13. Associated materials included several small pottery sherds, projectile points similar to those in the village, olivella shell beads, end scrapers, one small pendant, and three cylindrical bone awls or bodkins.

The cremated remains of a young individual found near one of the sites had no grave goods except for three olivella shell beads. Whether this burial is attributable to the Upper Republican occupancy or to one of the other complexes in the area is not known.

WOODLAND SITES

Although village sites showing Woodland affinities occur in the Medicine Creek Reservoir area, they are much less common and smaller in size than those occupied by the Upper Republican peoples. They are usually situated on low terraces or ridges well below the general level of the more extensive Upper Republican sites. Whether this placement reflects climatic differences at an earlier period, is an attempt at concealment, or had some other basis cannot now be determined.

The depth of the sterile overburden at the two sites investigated in the reservoir was no greater than that occurring at several of the Upper Republican sites. The depth, however, of the dark cultural zone was somewhat greater at the Woodland sites. Earth-covered houses such as were constructed by the Upper Republican peoples do not appear to have been in use during the Woodland occupancy. Habitation areas are in some cases marked by a circular to oval basin, excavated to a depth of 12 to 18 inches into the sterile soil below the village accumulation. Near the center of almost every basin is usually a rather poorly defined fireplace on the same general level as the basin floor. There is no evidence of a fireplace basin such as occurs near the center of the Upper Republican structures. Post molds and shallow pits often containing refuse occur without regard to a discernible pattern both within the basins and throughout the general village area.

Fragments of hard baked clay were present but there were no imprints of grass or other materials ordinarily used in constructing the roof of an earth-lodge. Small charred twig fragments were quite common throughout the basin fill and it seems likely they may have played a part in the roof construction. The size of many post molds suggests a fairly permanent roof, perhaps of brush with a grass and bark or skin covering. The semi-subterranean structures appear to have been grouped rather closely with a maximum perhaps of four to six at a site.

Artifacts, though not so varied as at Upper Republican sites, are, in general, well made with an emphasis on implements for hunting and gathering (Fig. 69, c).

Pottery is not plentiful and appears to represent a very simple type. No complete or restorable vessels were recovered but several sizable sherds suggest large wide-mouthed jars with pointed or slightly flattened bases. The exterior surface is, in most cases, rather finely cord roughened with the impressions usually extending vertically and parallel. Many of the interior surfaces of the sherds show very fine cord or fabric impressions extending at right angles to those on the exterior. The color is most commonly dark gray but a few sherds are buff in color; many are blackened by fire and are soot-encrusted. The sherds are characteristically tempered with an abundance of crushed calcite. The texture is particularly granular and the sherds tend to split and crumble. The bulk of the ware is rather soft, seldom more than 3 (calcite) in hardness. There is no evidence of decoration and the direct vertical rims are usually cord roughened. Most lip forms are flattened and beveled on the exterior. The thickness of the sherds varies but is considerably greater than that of the Upper Republican ware. Several have a thickness of 17 mm. and the majority are more than 9 mm.

Bone beads, the majority fashioned from bird bones, were very common. Several types not generally found in other complexes in the Central Plains are represented. They include undecorated tubular bone beads, shorter tubular beads decorated by incising, and a small barrel-shaped type seldom decorated.

Other specimens of bone include well made awls, some apparently fashioned from the metapodial of deer. Others are made from thick bone splinters, perhaps of bison bone.

Two small worked scapula sections appear to have been used as knives or scrapers. The scapula hoe or spade characteristic of later hor-

ticultural groups has not been recovered thus far from Woodland-like sites in Nebraska.

Stone work, while not as varied and abundant as from the Upper Republican, was moderately well represented. Materials available locally were, for the most part, utilized for making these specimens. However, a limited amount of obsidian, chalcedony, and various cherts not available in the immediate area were also used.

Chipped stone specimens include projectile points, end scrapers, flake scrapers, and knives. Small crudely flaked triangular specimens were common and may have been used as projectile points or knives. Small corner-notched or stemmed projectile points of excellent workmanship are of the SCb1, SCb2, and SCb3 types as defined by Strong (1935, pp. 88–9). The edges of several points of these types are delicately serrated.

End scrapers, although not common, are represented by a number of well made specimens. Numerous flakes have been retouched on one or more edges for use as scrapers or knives. Small chipped celts or scrapers, similar in shape but much smaller than those found in Upper Republican sites, were common. Somewhat less common were rather coarsely chipped knives ovoid in form with a tendency for one or both ends to be rounded. The four-bladed diamond-shaped knife has not yet been reported from Woodland sites in Nebraska. Objects of pecked or polished stone include irregularly shaped sandstone abraders, stream pebble pecking stones, and cupped mealing slabs.

Work in shell includes small disk beads, rectangular to oval shell pendants, mussel shell finely serrated on the outer edge, and a marine shell ornament.

The remains of materials probably utilized for food include mussel shells (somewhat less common than at Upper Republican sites) and various animal bones, many of which have not been identified. The remains of deer and antelope appear to be somewhat more common than bison. The presence of rather large numbers of bird bones suggest a greater dependence upon small game. They include grouse, quail, prairie chicken, hawk, magpie, and bald eagle.

Two disarticulated secondary burials were recovered from each of the two Woodland areas. At one site (25FT70) the remains were those of two very young individuals, while at the second site (25FT18) two adult skulls with other skeletal parts from only one individual occurred in a small shallow pit within the village area. Grave goods associated with the two adolescents included three shell pendants and hundreds of small bone beads representing all types found throughout the remainder of the two village sites. With the adult remains from 25FT18 were found pottery sherds, bone beads, fragments of worked shell, one marine shell bead, worked stone, and various unworked mussel shells.

DISCUSSION

Certain comparisons can be made as to the subsistence economies and material cultures of the two prehistoric pottery-making groups here represented. The Upper Republican village sites are larger and more numerous with rather extensive midden areas, and they have many pits of sufficient size for the preservation of considerable quantities of foodstuff. No direct or reliable inferential evidence of horticulture was found at either of the Woodland sites; at the Upper Republican sites there were corn, beans, sunflowers, and possibly squash remains.

The earth-covered house of the Upper Republican Aspect appears to have been much better constructed and better adapted to the local environment than does the small irregularly-shaped structure of the Woodland peoples. There was no evidence of fortifications or defensive placement of the house structures at any of the various sites.

Relatively the pottery from the Upper Republican sites is more varied and appears to have been made in much larger quantities. One Upper Republican village site of nine houses yielded rim sherds representing slightly more than 300 vessels while the larger of the two Woodland sites with three or four houses yielded rim sherds representing only 14 vessels. All this suggests a more permanent occupancy in Upper Republican than in Woodland times. Refuse from the Woodland sites seems to indicate primarily a hunting and gathering complex with an emphasis upon deer, antelope, and smaller game. Bison bones were more common at the Upper Republican sites, although small game was also well represented. Fish, crawfish, and fresh water mussels also appear to have made up an important part of their diet.

No certain evidence was found of specialized ceremonial structures or of ritualistic practices. Stone pipes, some of them elaborately carved or incised with figures of animals, carved human faces, incised human skull fragments, and various other artifacts of unknown but probably non-utilitarian function suggest a somewhat

more elaborate ceremonial life for the Upper Republican groups.

The two semi-sedentary groups briefly described above do not represent the full range of archaeological complexes known to be present in the Medicine Creek Valley. At least one site representing the Dismal River Aspect has been investigated near the upper reaches of Medicine Creek (Wedel, 1935, pp. 180–2). This complex, which has since been more intensively studied in other localities, appears to represent the late prehistoric and early contact period (Hill and Metcalf, 1942). No materials attributable to this complex were found in either the Upper Republican or Woodland sites investigated within the Medicine Creek Reservoir. The distribution of the Dismal River peoples, who apparently combined hunting and horticulture, was in general to the west of the Upper Republican area. There was, however, considerable overlapping of their ranges and any simultaneous utilization of an area by the Upper Republican and Dismal River peoples would probably be reflected in some of their cultural materials.

Pre-pottery groups, who preceded the Upper Republican and Woodland peoples into the area by a considerable period of time, left remains described elsewhere in this journal (pp. 260–6). Materials representing the rather considerable period between such relatively early lithic complexes and the earliest pottery-making groups in the area have not been defined.

No direct stratigraphic evidence was found for the relative age of the Woodland and Upper Republican materials in the Medicine Creek Reservoir. Elsewhere, however, it has been demonstrated that when found occurring on the same site the Woodland materials underlie the Upper Republican (Champe, 1946, pp. 83–98). Of the several Woodland variants known to occur in the Central Plains there is as yet no conclusive indication as to a possible chronological sequence.

Despite the rather complete inventories for twelve village sites attributable to the predominating complex in the area, the Upper Republican, the chronological picture remains rather uncertain. Pottery from the various sites show striking variations which may indicate temporal differences. A relative date based on dendrochronology may enable us to inject time perspective into the local Upper Republican picture. It is noteworthy that despite the comprehensive nature of the excavations and the relative nearness of the Medicine Creek locality to the Southwest, no Puebloan sherds or other artifacts were found.

As to wider relationships in the Plains area, the Upper Republican sites may prove to be assignable to the Lost Creek Focus or perhaps to an as yet undefined focus. In general the group of sites shows little evidence of influence from the Nebraska Aspect of eastern Nebraska which is believed to be contemporaneous with some Upper Republican groups.

The less well known Woodland variant represented by two sites in the reservoir cannot at the present time be identified with any heretofore designated types.[2] Superficially the ware is suggestive of the Valley Focus (Hill and Kivett, 1941, pp. 143–243). Similar calcite-tempered ware has been found underlying an Upper Republican occupation zone in western Kansas (Wedel, 1940*a*, pp. 83–8). It also occurs in small village sites to the east of Medicine Creek in Harlan County, Nebraska. The same type of ware has been recovered from several prehistoric ossuaries along the Republican Valley, which were characterized by the presence of large quantities of shell disk beads fashioned from fresh water mussel shells. It has been amply demonstrated, however, that other mass burials of somewhat different type with accompanying grave goods are attributable to the Upper Republican Aspect (Strong, 1935, pp. 103–14). Thus it appears that both Woodland and Upper Republican peoples practiced secondary burial and that shell disk beads were commonly used as mortuary goods.

The projectile points and incised bone beads are of rather unique types. Similar types have, however, been recently reported from a burial site with Hopewellian affinities from the Lower Republican Valley in Kansas (Schultz and Spaulding, 1948, pp. 306–13).

Further conclusions and correlations regarding the Medicine Creek area must await completion of a detailed analysis now underway, of the data collected.

River Basin Surveys
Burnett Hall
University of Nebraska
Lincoln, Nebraska

[2] In the author's opinion the calcite-tempered ware found here is a marker for one of several Western Woodland complexes, which is tentatively designated the Keith Focus.

WHITE CAT VILLAGE

JOHN L. CHAMPE

WHITE Cat Village, a newly-explored site of the Dismal River Aspect, is located on Prairie Dog Creek about 3 miles above the point where it joins the Republican River from the south.[1] The greater part of the village is included within a 70-acre field just southwest of the center of Section 24, Township 1N, Range 18W, some 6 miles southeast of Alma, Harlan County, Nebraska. The village occupies an area approximately 1000 feet long and 250 feet wide, lying along a 30-foot bluff which forms the north bank of Prairie Dog Creek at this point (Fig. 70, *e*). The terrace on which the site is located will be a few feet under the normal level of the Harlan County Reservoir, and nearly 20 feet below the maximum level.

A preliminary survey of the village was made in November, 1946, by Marvin F. Kivett and J. M. Shippee, for the Missouri River Basin Survey. In April, 1948, Dr. W. R. Wedel, Field Director of this Survey, invited the Laboratory of Anthropology, University of Nebraska, to join with the Survey in the investigation of the site. A Summer Field School in Anthropology was organized, and this University of Nebraska field party[2] spent six weeks in the excavation of the village. Maps, photographs, and field records were completed and filed after the party returned to the Laboratory, but the laboratory analysis of the data is not yet finished. This report, for that reason, is preliminary in nature and will include only summary descriptions and brief comparisons with earlier excavations. A detailed report of the work at the White Cat Village will be presented when the exploration of the site has been completed.

The Dismal River Aspect has received some previous attention and reports of this earlier work are readily available. Wedel (1935*a*, pp. 180–2) has published a brief report of work done in 1934 at the Dick site on Medicine Creek. Strong (1933, pp. 71, Fig. 72; 1935, p. 216, Pl. 22,*d*,*f*,*n*) reports Dismal River pottery from Signal Butte III, and also reports his surface reconnaissance of the type sites near the Forks of the Dismal River in company with A. T. Hill. Wedel (1940*a*, pp. 83–6) has summarized the excavation of a Dismal River site near the Pueblo ruin in Scott County State Park in western Kansas, and he has suggested the chronological placement of the aspect in Central Plains sequences (1940*b*, pp. 323, 343; 1947*a*, pp. 151–2, 154). A Dismal River component was identified at Ash Hollow Cave (Champe, 1946, pp. 19, 46, 62, 111), where it was associated with charcoal which has been dated by Harry E. Weakly (1946, pp. 105–10). Martin, Quimby, and Collier (1947, pp. 331–2) included a summary of the Dismal River culture in their review of North American archaeology. The most complete account, however, of any Dismal River manifestation is the report by Hill and Metcalf (1942, pp. 158–226) of the investigation of 25CH1, the Lovitt Village, located on Stinking Water Creek in Chase County, Nebraska. The detailed treatment of the artifact complex and other features of the Lovitt Village provides an excellent frame of reference for the present report.

Investigation of the White Cat Village by

[1] The name, White Cat Village, is used here for the first time, in lieu of the code numbers 25HN37 by which the site is identified. It would be pleasant to acknowledge the many courtesies extended to the Field School by the landowner, Robert D. Stephenson of Alma, by naming the village for him. His nephew and namesake, however, is the man who first brought the White Cat Village to the attention of the Laboratory of Anthropology party, in 1946, and another site already bears his name. The name selected lacks all known personal as well as anthropological connotations. Soon after work began at the site, the Field School was adopted by "Ma," a white mother cat and her kittens. Two of these—known as the "Ologies, Arch. E. and Eth. N."—were also white. The third kitten, a gray tabby, performed the unusual feat of getting in everyone's hair by being constantly underfoot. He somehow acquired only the initials "S. I."

[2] The Field Party included Mary Lou Callen, Mr. and Mrs. James H. Gunnerson, Sally Ann Johnson, Sally Herminghaus, James Howard, Gerard Mulraney, Walter Schnert, and Dr. and Mrs. John L. Champe. Mrs. O. L. Splinter was a welcome addition to the party for some ten days. George Metcalf rendered invaluable service during a three day visit to the camp, and on many occasions in the laboratory. Dr. W. R. Wedel was able to spend one day in camp, and his counsel and assistance were much appreciated.

the Field School began with the relocation of several cement blocks left as markers by the Smithsonian party, followed by the extension of these preliminary tests to full-scale excavations. Excavation was limited to the area nearest the bluff so that damage to the growing crop could be held to a minimum. A farm tractor equipped with an excavating shovel was made available by Carroll and Orley Stolts, neighbors and good friends. This equipment, manned by Orley Stolts, was used to open a trench nearly 800 feet long just within the plowed ground on the south side of the field and parallel to the bluff (Fig. 70, *e*). The trench was widened and squared by hand for most of its length and then examined on several successive levels. Evidence of a fireplace and associated post holes was found near the western end of the trench, and this section was then widened into a circular excavation 30 feet in diameter, with the fireplace as a center (Fig. 70, *b*). Similar excavations were developed around each one of the three fireplaces first located by the Smithsonian party (Fig. 70, *a, c, f*). A circular bed of white ashes and red burned earth was found within the trench some 300 feet from the western end. This feature proved to be a "roasting pit" much like those associated with three other Dismal River villages (Fig. 70, *d*).

A ring of well-defined post holes was associated with each one of the four fireplaces, and these complexes were interpreted as the remains of lodges. Other post holes were observed within the excavations and along the trench but they could not be associated into recognizable patterns. Further excavations, however, would probably reveal lodge patterns into which some of them could be fitted. No evidence of walls could be observed in any of the excavations, and the floor area could only be defined by the mixture of charcoal and camp detritus, often 6 inches or more thick, within the ring of posts.

Artifacts were not abundant within the excavations, although the total inventory seems adequate for classifying the site as a Dismal River village. This primary collection of excavated items has been augmented by a large collection of surface material built up by thorough search of the village area whenever conditions were favorable. The two collections were studied independently, but no significant differences were observed. A few small sherds which do not appear to be of Dismal River type, were found in the surface collections. These occurrences were too rare to suggest more than one occupation of the area and may derive from one of the several sites within a short distance of the White Cat Village.

The records of the excavations include maps of the site and of each major excavation unit, daily journals, and detailed descriptions of some 200 individual features, supported by photographs. All of these records, as well as the artifacts collected, are on deposit in the Laboratory of Anthropology, University of Nebraska, where they will be available to students of Central Plains archaeology.

EVIDENCE OF STRUCTURES

Each one of the four fireplaces was associated with a clear-cut pattern of post holes. In three of the four cases, five posts were arranged almost symmetrically around the fireplace (Fig. 70, *a, b, f*). The fourth pattern was incomplete although it was clear that it was originally a hexagon. Within each ring of posts, the earth was mixed with charcoal and camp detritus to a depth of 5 or 6 inches below the level of the top of the fireplace. Outside the posts, the earth was less mixed with camp detritus although occasional inclusions of artifacts were recorded. No acceptable evidence of an outer ring of posts was found, although a careful search was made in every case.

The rings of posts in these patterns varied from 12 to 15 feet in diameter. The post holes were from 5 to 8 inches in diameter, and were 15 to 20 inches in depth below the level of the top of the fireplace. Supports of this size seem larger than would be needed for so small a lodge, and this, in turn, suggests that the original structure is not completely represented by the evidence in hand. It has been suggested that the main supports were connected at their tops by stringers, and that long poles were leaned against these horizontal beams to form an outer wall. Direct evidence of such construction is lacking but this speculative reconstruction offers an interesting solution to the problem.

The three pentagons were oriented so that one side faced approximately east. In all three cases, two smaller post holes were found beyond this eastern side, 4 to 5 feet apart and 12 or 13 feet from the fireplace. The placement of these smaller posts suggests that they may have been the outer posts of a doorway (Fig. 70, *a, b, f*).

The fourth pattern was a hexagon in which one post was missing, as were the two smaller posts (Fig. 70, *c*). Only 6 feet separated the fireplace for this pattern from that of one of the

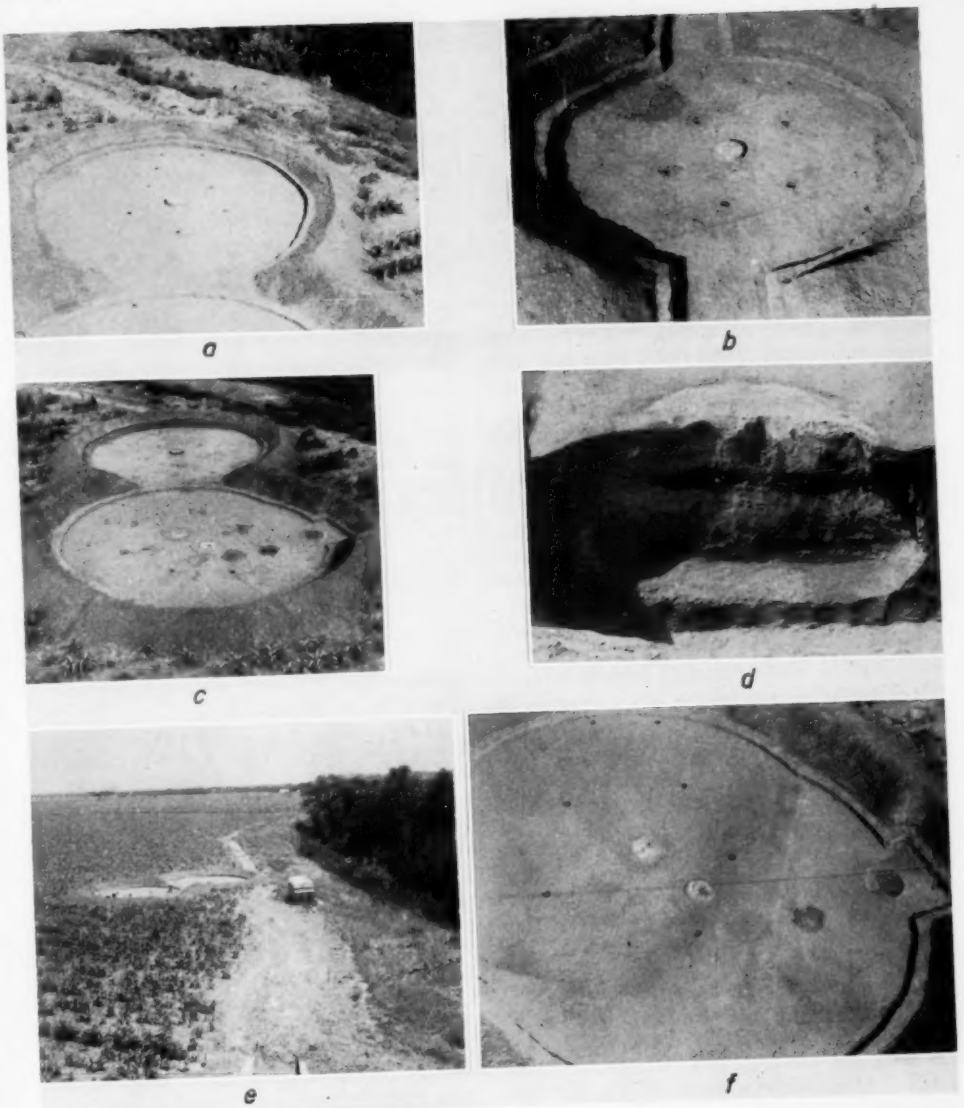


FIG. 70. Excavations at White Cat Village: *a*, the excavation and post pattern for Lodge 3; *b*, the excavation and post pattern for Lodge 4; *c*, the excavations for Lodges 1, 2, and 3, with the post pattern for Lodge 2 in the foreground and for Lodge 3 in the background; *d*, the roasting pit in vertical section; *e*, general view looking northeast from the western end of the long trench; *f*, the excavations for Lodges 1 and 2, showing the main post holes, fireplace, and door posts for Lodge 1, with the fireplace for Lodge 2 near the outer row of posts.

pentagons, and it may be that the missing posts of the hexagon pattern were obliterated by the construction of the pentagon. This indication of a time difference could not be confirmed by comparison of the two artifact inventories.

The post-and-fireplace patterns are interpreted as the remains of lodges and it seems probable that the entire original structure is not represented. The five-post pattern is well established at White Cat Village and this pattern is also reported from the Lovitt Village, where House 2 is almost identical with the three pentagons from White Cat (Hill and Metcalf, 1942, Pl. IV: 1; Pl. X: 2). Whatever these lodges may be, it is clear that they are quite different from the semi-subterranean earth-lodges so common on the Central Plains.

The "roasting pit" was found in the long trench not far from three of the lodges, and only a few feet from the edge of the bluff. The pit was bell-shaped and the walls and bottom were burned bright red. The orifice was 40 inches wide, and the pit itself was 25 inches deep, from the trench bottom, and 52 inches in its greatest diameter.

Six strata were clearly defined in the vertical cross section of the pit (Fig. 70, *d*). These were, from bottom to top: a thin layer of ash, a thicker layer of top soil, a thick stratum of bright yellow clay, a thinner layer of charcoal, a second stratum of the bright yellow clay, and, at the top, about 6 inches of top soil, containing a few artifacts, including two bison bone fleshers, and a moderate amount of broken bone and camp refuse.

Roasting pits of this kind seem to be a characteristic of Dismal River villages in the Central Plains. One was reported from 25DN1 in southwestern Nebraska (Hill and Metcalf, 1942, Pl. III: 2), and Wedel (1940*a*, p. 83) mentions them at the site in Scott County, Kansas. They have not been reported from the other major aspects in the Central Plains.

The large trash-filled pits so common at the Lovitt Village are rare at the White Cat Village. Shallow pits with concentrations of refuse were found but none of the Lovitt Village type were found by the Field School, although M. F. Kivett (personal communication, 1948) reports the excavation of one in 1946. More complete excavation may disclose them, or it may be that the occupation of White Cat Village was so short that few such pits had been dug. This suggestion of a relatively short occupation is reinforced by the absence of corn and the rarity of scapula hoes and other agricultural tools.

ARTIFACTS[3]

Ceramics. The pottery from the White Cat Village, save for a few sherds, seems identical with that from the Lovitt Village and other Dismal River sites. Briefly, Dismal River pottery is thin, hard, fine-textured, with moderate amounts of fine sand tempering. A few sherds which include fine mica particles with the tempering material, are reported from several sites. The color range is from buff to glossy black, with black and dark-grays predominant. The outer surface may be smooth, but usually shows treatment with a grooved rib or thong-wrapped paddle to produce the "simple stamped" finish (Metcalf, 1949). A few light-colored sherds have black spots which seem to be parts of a design, usually placed on the inner surface of the sherd. Similar sherds were found at the Lovitt Village and at Ash Hollow Cave (Champe, 1946, Pl. 6, p. 111), as well as at White Cat. Rim profiles are simple. The rim is moderately high, with thickening only at the lip, and usually flared slightly. Perhaps half of the rims have a simple rounded lip; the others show definite flattening, with, in many cases, a marked outward eversion.

Three pottery types have been offered by Metcalf for Dismal River pottery under the names Lovitt Simple Stamped, Lovitt Plain, and Lovitt Mica Tempered (Metcalf, 1949; Hill and Metcalf, 1941, Pls. V, VI). The first two named are distinguished only by the surface treatment, and Metcalf has pointed out that sherds of both types have been observed from one pot. These two types made up the entire White Cat sherd inventory, save for one Mica Tempered sherd. A sample count of one hundred of the largest sherds indicates a relative proportion of five Simple Stamped sherds to one Plain at the White Cat Village.

A few sherds assignable to complexes other than Dismal River were found during the investigations. Some ten or twelve small sherds picked up during the surface survey are probably Upper Republican pottery fragments. One sherd from a depth of 16 inches in the trench

---

[3] Dismal River ceramics and artifacts have been illustrated elsewhere (Hill and Metcalf, 1941; Champe, 1946; Metcalf, 1949); hence, the available space has been utilized for site pictures.

is much like sherds classified as Woodland from an ossuary, 14PH4, about 5 miles upstream. These occurrences were not regarded as evidence of secondary occupations, since there are several known sites within a short distance of the White Cat Village.

Stone. The chipped stone inventory is relatively large, although the number of types represented is somewhat limited. In general, the chipped stone artifacts are effective tools rather than beautifully worked objects. The chipping is well-done but it is confined, in most cases, to the working edges. The preponderance of skin-dressing tools, such as end and flake scrapers of all kinds, may indicate a preoccupation with hunting and the dressing of hides at this village.

Chipped stone artifacts include: end scrapers of all kinds, from well-made tools to flakes with only a working edge chipped; end scrapers with a small graver point added on one edge; a fragment of a four-edged knife, alternately beveled; a few thick ovate blades, with bi-face chipping; drills with expanding heads; plain slender drills; plain drills with side tabs; triangular points, with or without side notches, abundant; stemmed points, present but rare; large numbers of flakes, with minor retouching or evidence of use as edged tools.

Abraders of Dakota sandstone are common, and several specimens of a white grit were found. Some 30 well-worn pebbles of soft white sandstone were found. All were much used, presumably for dressing or whitening hides. A small piece of red stone may be part of a catlinite pipe, the only pipe fragment reported from this village.

Bone. Artifacts of worked bone include: bison scapula hoes and choppers; fleshers, not toothed, of bison metatarsals; one fragment of a shaft wrench, made of bison rib; broken awls, one with a shallow groove along one side; two long tubular beads, of dog or coyote long bone.

Faunal remains included: abundant bison bone, *Bison bison;* turtle, shell and bone, quite common; less common, beaver, *Castor canadensis*, and white-tailed deer, *Odocoileus virginianus*, ref.[4] Remains of chicken and cow bone in the surface collections can be attributed to recent non-Indian occupancy. No worked shell was found, but unworked shell was common. Comparison of these fragments, by the writer, with the Laboratory type collection indicates a tentative identification as *Uniomerus tetralasmus* (Say).

Other objects. A number of pieces of metal were found in the field and identified as recent in origin. Two items, however, appear to be parts of iron trade hoes modified for use as hide scrapers. Two bits of brass were preserved; one of these is rolled up to form a jingle, the other is flat, but of a size suitable for the same use.

A small chipped stone object looks much like a four-sided scraper, but the flint is quite unlike any other material from the site. It is believed to be a trade gunflint. One small fragment of obsidian was found on the surface just outside the excavation for Lodge 3. Hill and Metcalf (1942, p. 208) report obsidian from all of the Dismal River sites they considered, but it is very rare at the White Cat Village.

The great similarity, approaching identity, between the archaeological manifestations at the Lovitt and White Cat villages has been much emphasized. A few new traits appear at White Cat Village, and a few of the Lovitt traits are missing. These minor differences will probably be reduced by further work at White Cat Village, and by a re-examination of the Lovitt material. Ample evidence is available, however, to justify the designation of the new village as the White Cat Component of the Stinking Water Focus of the Dismal River Aspect.

DISCUSSION

Assignment of the White Cat Village to a known archaeological complex clears the way for a brief consideration of ethno-historical and anthropological implications. Three Dismal River sites have been dated *ca.* 1700 A.D. by tree-rings (Hill and Metcalf, 1942; Champe, 1946; Weakley, 1946), and Wedel (1947, p. 151) suggests a similar date for the Scott County site, relying on datable Pueblo material associated with Dismal River remains. Charcoal from the White Cat Village has not been studied, but the marked likeness between the White Cat and Lovitt villages suggests contemporaneity in time.

The problem of the identification of the Dismal River peoples with one of the Plains Indian tribes has been considered by Wedel (1940*b*, p. 323; 1947*a*, pp. 151–2) and by Hill and Metcalf (1942, pp. 164–5, 212–13). All

[4] All faunal remains, except shell, were identified by Weldon D. Frankforter, Assistant Curator of Paleontology, University of Nebraska State Museum, whose assistance is gratefully acknowledged.

three clearly favor one of the Apache tribes, although they have not made a specific identification. These opinions can be commended, as well as the restraint these authors have shown, although it is now possible, thanks to new evidence, to bring the picture of Western Plains in the early eighteenth century into sharper focus.

A preliminary review of certain historical facts is essential. In 1706, Ulibarri was sent from Santa Fe to El Cuartelejo to liberate a group of Picuríes Indians held as slaves by the Cuartelejo Apaches. In his report, Ulibarri mentions the Comanche, then menacing Taos from the north, and also the presence of Frenchmen among the Pawnee far to the northeast. In 1719, Governor Valverde led an expedition against the Comanche, but he failed to find either the Comanche villages or their war parties, although he penetrated well beyond the Arkansas River into east-central Colorado. On his return to the Arkansas River, Valverde met a group of Cuartelejo Apaches, and they were joined in a short time by a band of Paloma Apaches, whose home was said to be "farther in from El Cuartelejo, on the most remote borderlands of the Apaches" (Thomas, 1935, p. 132). The governor examined a wounded Paloma and was told that the Indian received the wound when his peoples were driven from their home by the Pawnee, allied with the French and Jumano. The governor further states that "these Indians told me that those of their tribe who were settling in El Cuartelejo had deserted the spot and were dispersed among the other rancherias of their tribes because they were molested and persecuted by the Utes" (Thomas, 1935, p. 132).

In the following year, 1720, Governor Valverde sent an expedition under Villasur to the Platte River in present-day Nebraska, where it was completely destroyed by the Pawnee and their allies. This defeat ended attempts by Spain to control Apachería, the Spanish name for the plains around El Cuartelejo, and the territory soon fell to the advancing Comanche.

A personal collection of photostatic copies of early French and Spanish maps includes a reproduction of a map which contains pertinent information regarding the Comanche and the Cuartelejo Apache.[5] The legend on this map states that it was drawn in 1770 from an earlier map made by Don Francisco Alvarez Barreiro at the order of the Viceroy, Marques de Casafuerte, transmitted by the Brigadier Don Pedro de Rivera.[6] This statement in the legend identifies the original map and relates it to the present discussion.

Juan de Acuña, Marques de Casafuerte, was Viceroy of Mexico from 1722 to 1734. Casafuerte appointed Don Pedro de Rivera as his Visitor, and Rivera, in 1724, began a tour of the provinces which brought him to Sante Fe in 1726, just at the time, incidentally, when the Comanche pursued some Apache, Escalchufines, and Palomas into Sante Fe itself. Rivera was accompanied by Don Francisco Alvarez y Barreyro, Principal Engineer of Texas, who was commissioned to draw maps of the several provinces. Six of the Barreyro maps are said to be in the Archivo General de las Indias in Seville, and one of them, drawn in 1727, is clearly such a map as Surville describes in the legend (Wagner, 1937, pp. 326, 362–4, Map 122). The Surville map of 1770 is carefully drawn, and this suggests that it is an accurate copy. It will be desirable, however, to confirm that opinion by a detailed comparison of the two maps whenever that becomes possible.

The information supplied by the Surville map is of first importance in clarifying the Padouca problem. The "Tierra de los Comanches o Padoucas" is clearly indicated on this map just west of the headwaters of the Rio Grande. The "Apaches Palomas" are placed east of the mountains in what is now central Colorado, and 50 leagues farther east are the "apaches del nanisue," not as yet identified. Seventy leagues east of this last tribe are the "apaches de quartelejos," which would bring them well into western Kansas of today, near the traditional location of El Cuartelejo in Scott County State Park. The meridian of San Antonio, shown on the map some 30 leagues east of "quartelejo," confirms this placement. The Surville map, then, supports the identification of the Scott County pueblo with El Cuartelejo, and it also shows that the Spanish

[5] The original of this map is in the British Museum. I am indebted to the Ayer collection, Newberry Library, Chicago, for my copy.

[6] The legend, in part, is as follows: " . . . Levantado de orden de el Exmo Señor marques de casafuerte, virrey, governador, y capitan General de estos reynos, por Don Francisco Alvarez Barreiro Ingeniero principal de la provincia de los tejas, siquiendo las ordenes, qui para este efecto e fueron dadas por el Brigadier de los Reales exercitos Don Pedro de Rivera. . . . Reducido y delineado por Don Luis de Surville en 4 de Julio del año de 1770."

at that time distinguished the Comanche, or Padouca, from the Lipanan tribes of Apachería (Harrington, 1940, pp. 509–12).

Acceptance of the Scott County site as El Cuartelejo carries with it the identification of the associated Dismal River site which Wedel (1947, p. 151) dates *ca.* 1700, as the village of the Cuartelejo Apache visited by Ulibarri in 1706. This, in turn, justifies the further inference that the Apachería of the early eighteenth century is represented archaeologically by the several Dismal River villages dated at *ca.* 1700. One may speculate that the White Cat Village is the very place where the Paloma Apache who complained to Valverde received the wound which the Governor examined (Thomas, 1935, pp. 132, 143).

Some further comments on the term Padouca seem desirable. The Spanish usage seems clear. They called the Comanche who lived in southern Colorado by the name Padouca, but they did not apply this name to the Lipanans of Apachería. French maps of this period, however, indicate that the French extended the term to include the Lipanan as well as the Comanche. The Vermale, 1717 map designates Apachería as the "Pais des Appaches ou Padoucas Orientaux" and several versions of the Beauvilliers map of 1720 distinguish the "Padouka blanc, Ennemis des Espagnols" from the "Padoukas Noirs" who live nearer to Santa Fe.

The Padouca met by Bourgmont in 1724 are almost certainly Comanche, who must have replaced the Lipanan Apache in Apachería within a short time after 1720. Precise documentation of this rapid change is lacking, although it is well known that by 1750 the Comanche were in full possession. Some interesting ethnological data, however, support the opinion that the Padouca met by Bourgmont were really Comanche. When Bourgmont and his party first met these Padouca, the Indians were well supplied with horses[7] but the Cuartelejo and Paloma Apache met by Valverde in 1719 were living in tents which were carried on dogs (Thomas, 1935, pp. 131, 143). No horse bones have been reported from any of the Dismal River villages, which is consistent with the identifications suggested.

The various matters touched upon in this paper can be summarized briefly. Excavation of site 25HN37 resulted in the identification of the White Cat Component of the Stinking Water Focus of the Dismal River Aspect. An occupation date of *ca.* 1700 A.D. has been suggested by comparison with similar sites datable by tree rings.

New cartographic evidence lends strength to the identification of the Pueblo ruin in Scott County State Park as El Cuartelejo of early eighteenth century records. This identification carries with it the association of the nearby Dismal River village with the Cuartelejo Apache, and permits the further suggestion that the Lovitt and White Cat villages were the homes of the Paloma Apaches or their Lipanan Apache neighbors. There is also some evidence that just after 1720 the Comanche displaced the Lipanan tribes of Apachería almost overnight, and, further, that the Padouca with whom the French established contact in 1724 were the Comanche rather than those Apaches who were also called "Padoucas Orientaux."

The discussion and tentative conclusions of this report are not wholly consistent with recent suggestions regarding the affiliations of the Dismal River culture. Martin, Quimby, and Collier, in a thumbnail sketch of the Dismal River culture (1947, pp. 331–2), include the following conjectures:

> The Dismal River culture is known to have been contemporaneous in part with the Upper Republican and Nebraska cultures. . . . Possibly Dismal River is a descendant of the Sterns Creek culture.

The second statement probably echoes a similar and earlier suggestion by Griffin (1946, p. 54).

This seems to be an appropriate occasion to enter a dissenting opinion to both conjectures. There seems to be no direct evidence to support the thesis of contemporaneity between the Dismal River Aspect and either the Nebraska or Upper Republican cultures. There is stratigraphic, as well as dendrochronological evidence, however, which demonstrates a definite time gap between the Upper Republican and the Dismal River occupations of one site in western Nebraska (Champe, 1946).

Support is also lacking for the second conjecture. Some resemblance can be claimed between Dismal River and Sterns Creek ceramics, but this likeness is far from identity, and the

[7] Margry, 1888, Vol. 6, p. 433. After salutations had been exchanged between the French and the Padoucas: " . . . . Ensuite, ils monterent tous nos François sur leurs chevaux, les uns sur un cheval, les autres en croupe; ils y monterent aussy les Sauvages, qui venoient avec nous. . . . "

two culture complexes, taken as wholes, have little in common. Sterns Creek is on the Missouri River in eastern Nebraska, where the fauna and flora are comparable to those of southern Wisconsin. The Dismal River villages are confined to the short grass country on the eastern border of the High Plains. Bridges will be needed for this ecological gap, as well as for the 500-year gap in time, before the second suggestion can be given really serious consideration.

The identification of the Dismal River people with the Cuartelejo and Paloma Apache and other Lipanan peoples of Apachería of 1700 is tentative and subject to further research, but it lends a special interest to a small village of what has been called a "lack-luster culture complex." White Cat Village may be one of the villages from which the Paloma Apache said the Pawnee had driven them in 1719. It is almost certainly one of the last truly aboriginal communities of the Paloma Apache, or whatever tribe is finally identified with the White Cat people. This leads to one final recommendation. The small area covered by the village, and the fact that only a few inches of plowed top soil need be removed to expose the subsurface structures, makes the complete excavation of the village a simple matter with power equipment, although it would be too large a task for a Summer Field School with only hand labor. This archaeologist earnestly hopes that the Smithsonian Institution will be able to arrange for the necessary mechanical assistance which will permit full excavation of this key site.

Laboratory of Anthropology
University of Nebraska
Lincoln, Nebraska

ARCHAEOLOGICAL INVESTIGATIONS IN ELLSWORTH AND RICE COUNTIES, KANSAS

CARLYLE S. SMITH*

ARCHAEOLOGICAL investigations were carried on by the Museum of Natural History, University of Kansas, from June 19 to August 20, 1948, in the Kanopolis Reservoir area on the Smoky Hill River in Ellsworth County and also along the Little Arkansas River in Rice County, Kansas. The River Basin Surveys of the Smithsonian Institution had undertaken the preliminary reconnaissance and had found more than twenty sites in the area of the Reservoir. William O. Leuty of Ellsworth was helpful in guiding the field parties of both institutions to most of the sites; also he gathered surface collections which were turned over to us.

The Kanopolis Reservoir is situated in the highly dissected terrain which marks the Plains border along the 98th meridian of longitude in central Kansas. The Smoky Hill River meanders eastward, fed by many tributary streams and canyons. Outcrops of Dakota sandstone are common on the bluffs bordering the valley and trees are limited to the edges of the streams. Rolling grass-covered plains are seen to the north and south of the river above the bluffs. Lake Kanopolis now covers some 3,500 acres, and in times of flood as much as 13,900 acres, of the valley floor. In Rice County, the Little Arkansas River, a tributary of the Arkansas River, flows southeastward through less dissected terrain.

The area around the Kanopolis Reservoir was part of a border land where the territories of several peoples met in the historic period. The Smoky Hill River seems to have formed the northern boundary of the Wichita, who had a number of villages to the south. The land north of the Smoky Hill formed part of the territory of the Pawnee. To the east were the Kansa and to the west were people known as the Padouca (Apache?). Later on, the area was within the range of the wandering Cheyenne and Arapaho.

No documented historic sites are known in the region and traces of protohistoric occupations are rare except in the vicinity of the Arkansas River, where the Great Bend Aspect may represent the protohistoric Wichita (Wedel, 1942). In the Kanopolis Reservoir one petroglyph site offers evidence of an occupation after the introduction of the horse. The other

* The author was assisted in the field by his wife, Judith P. Smith, and by three students, Richard Murray, Ferdinand Okada, and Gary Vescelius.

sites in the reservoir are devoid of any evidence of contact with Western civilization and most of them are assignable to prehistoric cultural complexes previously defined as follows: Woodland, Hopewellian, Upper Republican, and Great Bend. In Rice County one Great Bend site was investigated and specimens were collected from the surfaces of others. Evidence of occupations by more than one cultural complex on some of the sites makes it impossible to present all of the data in historical sequence. As far as possible the approach is from late to early.

PETROGLYPHS

The Indian Hill site (14EW1) consists of an outcrop of Dakota sandstone situated between the mouths of Red Rock and Horse Thief canyons on the north side of the Smoky Hill River. The vertical face of the cliff is covered to a height of approximately 8 feet with petroglyphs which were carved in the soft rock. Three groups of the drawings have been illustrated by Mallery (1893, pp. 80–1, Fig. 44) and were recorded prior to 1869. The only changes since then have been the additions of recent initials, names, and dates. The petroglyphs include representations of owls, cervids, bison, bison tracks, beaver, conventionalized human figures, thunder birds, "turkey" tracks, serpentine motifs, and ladderlike designs. In two places, not shown by Mallery, are equestrian figures. One of them shows a man, holding a long lance, astride a horse. At a point where the talus meets the cliff a diamond-shaped knife, several end scrapers, and a few chips of chert were found. Probably such objects were used in carving the petroglyphs into the face of the cliff. Similar artifacts occur in Great Bend and Upper Republican sites in the Plains and offer little in the way of evidence which can be used in determining the authorship of the drawings.

The presence of petroglyphs depicting equestrians suggests a late date for many of the drawings. The Cheyenne and, possibly, the Arapaho may have contributed their share because local traditions refer to the presence of these groups as late as the 1870's. Grinnell (1915, p. 249) states that the Cheyenne were attacking the stage line along the Smoky Hill River just to the west of the area in 1867.

GREAT BEND SITES

The Great Bend or Paint Creek culture (Wedel, 1942) is represented in the Kanopolis Reservoir by two stratified levels in the Thompson Creek site (14EW6). The site consists of four habitation levels exposed in a road cut near the confluence of Thompson Creek and the Smoky Hill River. Alternating sterile zones and layers of dark soil containing hearths filled with white ashes extend along the road for a distance of approximately 75 feet. A profile 60 feet long was trimmed along the bank and the layers were designated A, B, C, D from top to bottom

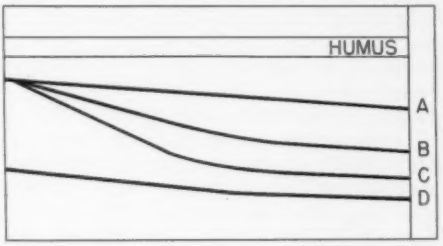


FIG. 71. Profile showing four cultural horizons at the Thompson Creek site. Vertical scale exaggerated.

(Fig. 71). All four layers dip toward the stream and are more deeply buried where they reach it. Samples of the contents of each layer were obtained by cutting back the face of the profile. Later, a bulldozer was used to remove some of the overburden. The heavy rains which occurred during the field season caused the reservoir to rise and cover the site before the investigations could be completed.

Level A, overlain by humus and massive sediment, consisted of a dark line containing occasional flecks of charcoal and traces of white ashes. At the northern end of the profile the horizon was 1 foot 6 inches below the surface and dipped to a depth of 3 feet 9 inches at the southern end. The layer yielded two sherds of Great Bend pottery identifiable as Geneseo Plain (Wedel, 1948*c*), one fragment of an elongate mano, one small flake retouched on all edges, and numerous animal bones.

Level B, overlain by a deposit of compact silt, was made up of a layer of stained soil, charcoal, and white ashes averaging 2 inches in thickness. Several basin-shaped hearths composed of white ashes underlain by burned earth were noted. The layer dipped from a contact with Level A to a depth of 4 feet 6 inches at the south end of the profile where a thin layer of silt intervened, dividing the layer into two parts. Level B was the richest in artifacts. The

Great Bend culture is represented by 100 sherds of Geneseo Plain (Fig. 72, A, B), 17 sherds of Geneseo Simple Stamped, one triangular projectile point with a straight base, three crude side scrapers, two sandstone abraders, one fragment of polished bone, and numerous animal bones.

Level C, overlain by a deposit of massive sediment, was marked by a thin zone of stained soil containing a few basin-shaped hearths filled with white ashes and underlain by burned earth. The layer joined Level B at the northern end of the profile and dipped to a depth of 5 feet 9 inches at the southern end. Two small sherds with little or no outer surface remaining were found. Comparative study suggests that the sherds belong to a ceramic tradition other than Great Bend. The temper and texture are coarse, suggesting Upper Republican or some Woodland manifestation. In this connection it is noteworthy that a large body sherd of Woodland pottery was found in the talus when the bank was being cleaned to reveal the profile. Broken animal bones and fragments of charcoal complete the inventory of Level C.

Level D, overlain by a deposit of compact silt, consisted of a thin layer of stained soil, charcoal, and a few basin-shaped hearths filled with white ashes underlain by burned earth. Level D did not contact Level C at the northern end of the profile where Level D appeared at a depth of 3 feet 3 inches and dipped southward to a depth of 6 feet 9 inches. The only objects found were broken animal bones. The layer was underlain by a deposit of massive sediment.

Additional specimens were collected from the surface of a plowed field a few hundred feet to the northwest of the main exposure. They include 12 sherds of Geneseo Plain, one unclassified cord-roughened sherd, one unclassified incised sherd, and one broken plano-convex end scraper. In establishing the profile at the main exposure the following artifacts were found: 15 sherds of Geneseo Plain, eight sherds of Geneseo Simple Stamped, one cord roughened Woodland sherd, two side scrapers, one flake knife, one bone punch or flaker, and one bone awl.

To summarize the data from the Thompson Creek site: Four superimposed occupation levels were found. No artifacts were found in the earliest horizon, Level D. The meager yield from Level C suggests an occupation by a pottery-using culture other than Great Bend. Level B represents the heaviest occupation and is assigned to the Great Bend culture. Level A is assigned to the same culture on the basis of two sherds. The position of the site at the junction of two streams suggests that the sterile zones of sediment may have been deposited in times of flood. Wedel (1947*a*, Fig. 51) shows a range in time from approximately 1475 to 1675 for the Great Bend Aspect. The sediments overlying Levels A and B suggest that the Smoky Hill River and Thompson Creek were flooding their valleys and depositing sediments at this time. Since the cultural identity of the people who occupied the site at Levels C and D cannot be determined, any attempt to correlate the various periods of flooding with climatic cycles in the Plains would be premature. On the basis of the data recovered, the distribution of the Great Bend Aspect is extended westward from Paint Creek and northward from the Little Arkansas River to the Smoky Hill River, but the yield of artifacts is too meager to suggest any regional or temporal variation from the culture as defined elsewhere. The site appears to mark periodic camps and it is doubtful whether complete excavation would have furnished data comparable to those found in the large village sites. The filling of the Kanopolis Reservoir precluded further work.

The Major site (14RC2) yielded a considerable amount of data on the Great Bend culture. The site consists of a series of small mounds of refuse scattered along a low ridge between the Little Arkansas River and Horse Creek in the township of Galt, Rice County. One refuse mound was tested by digging a trench 4 feet wide and 28 feet long through it. Another mound was excavated in 8-inch levels within 5-foot squares. In both mounds the refuse was from 16 to 36 inches thick and was composed of stained soil mixed with fire-cracked stones, broken animal bones, charcoal, potsherds, and implements of flint, of sandstone, and of bone. Some portions of the second mound had been disturbed by the intrusion of large bell-shaped cache pits filled with similar detritus.

The artifacts closely resemble those found at other Great Bend sites such as the discovery site on Paint Creek (Udden, 1900; Wedel, 1935 *c*) and those found on Cow Creek and the Little Arkansas River by Wedel (1942). The pottery falls readily into the types established at the Fifth Plains Archaeological Conference (Wedel, 1948*c*). Geneseo Plain (Fig. 72, C, D, E) predominates over all of the other types.

Geneseo Simple Stamped (Fig. 72, G) is second in prevalence. Geneseo Red Filmed and Cowley Plain are also present. I have added another type, Little River Cord Roughened (Fig. 72, F), which includes the cord-roughened sherds mentioned by Wedel (1942, p. 5). The pottery from the site is characterized by fine grit or sand tempering and occurs in the form of jars which are usually less than one foot in height. A few sherds are shell tempered. The rims may be straight or flaring. The shoulders are rounded and the bottoms often flattened. Handles are present in three principal forms: strap, perforated lug, and loop (Fig. 72, C, D, E). Most of the vessels lack decoration on the rim but some bear incised lines or notches on the lip. Plain vessels outnumber those with roughened surfaces. Of secondary importance are those bearing the impressions of a grooved and/or thong-wrapped paddle. Some vessels are coated with a fugitive red paint. A smaller proportion have cord-roughened surfaces suggestive of the ceramic tradition of the earlier Upper Republican culture.

A study of the stratigraphic distribution of the types in the undisturbed portions of Mound 2 indicates that Geneseo Plain increased in popularity from the bottom to the top of the deposit. It predominates at all levels, however. Cowley Plain, the shell tempered pottery, is rare but tends to occur near the top. All of the other types decrease toward the top of the mound. When the statistics are available from other Great Bend sites it may be possible to arrange them in a seriation which will suggest their relative chronological positions.

No artifacts of European or Pueblo origin were found at the Major and Thompson Creek sites but Wedel (1942) reports such items as chain mail and painted pottery from other sites in the region. Marjorie F. Tichy (letter, September 10, 1948) of the Museum of New Mexico has identified a number of sherds found in the Little River area. A surface collection from the Hayes site (14RC3), one mile west of the Major site, contains a Pueblo sherd associated with Great Bend pottery. It is of Rio Grande glazed ware, Late Glaze E or F, dating from the seventeenth century. At Spriggs Rocks (14RC1) approximately 3 miles south of the Major site, a collection of Pueblo sherds was gathered from the surface of a sandy slope devoid of other ceramic remains. The sherds seem to have formed part of one olla identifiable as Late Glaze C to Early D, characteristic of the Galisteo Basin and dating from the pre-Spanish portion of Pueblo IV. These dates compare favorably with those suggested by Wedel (1947*a*) for the Great Bend culture, *ca.* 1475–1675. The absence of objects of European and late Pueblo origin at the Major and Thompson Creek sites suggests that both of them date from the period prior to the Coronado expedition of 1541.

In connection with Southwestern potsherds it is worthy of note that the painted sherds found by Williston and Martin (Martin, 1909) in 1898 at the Scott County Pueblo have been identified by Tichy and indicate a late seventeenth century date for the ruin. Wedel (1947*a*) reports Great Bend sherds along with a sherd of Tewa Polychrome and an incised pipe stem which are assigned to the latter part of the seventeenth and the early part of the eighteenth centuries. The Williston and Martin sample shows the presence of Tewa and Pojoaque Polychrome, "Kapo" black ware, late red wares, and Rio Grande culinary wares. Taken as a group, these varieties indicate a late seventeenth to early eighteenth century date for the site. Along with the Southwestern pottery and the few sherds of Great Bend pottery were numerous specimens of Dismal River pottery (Hill and Metcalf, 1942). Some of the sherds previously classified along with sand-tempered sherds as Dismal River are identified by Tichy as "late Rio Grande micaceous culinary ware." I suggest, however, that the mica-tempered ware of New Mexico may represent an instance of diffusion from the Plains into the Southwest. The need for a detailed study of Rio Grande utility ware is apparent. The data indicate, then, a partial overlap in time in Kansas for Great Bend, Dismal River, and refugee Pueblo groups from the Upper Rio Grande.

UPPER REPUBLICAN SITES

The Upper Republican culture is represented in surface collections from a number of small sites throughout the Kanopolis Reservoir. Probably the remains of earth lodges are present at sites along Clear Creek on the north side of the Smoky Hill River but the limited amount of labor and time available caused our attentions to be directed toward the collecting of data pertinent to the definition of cultures which are less well known in the Great Plains. Upper Republican sherds were found at the Elm Creek site (14EW12) described below. The only rim sherd pertaining to the Upper

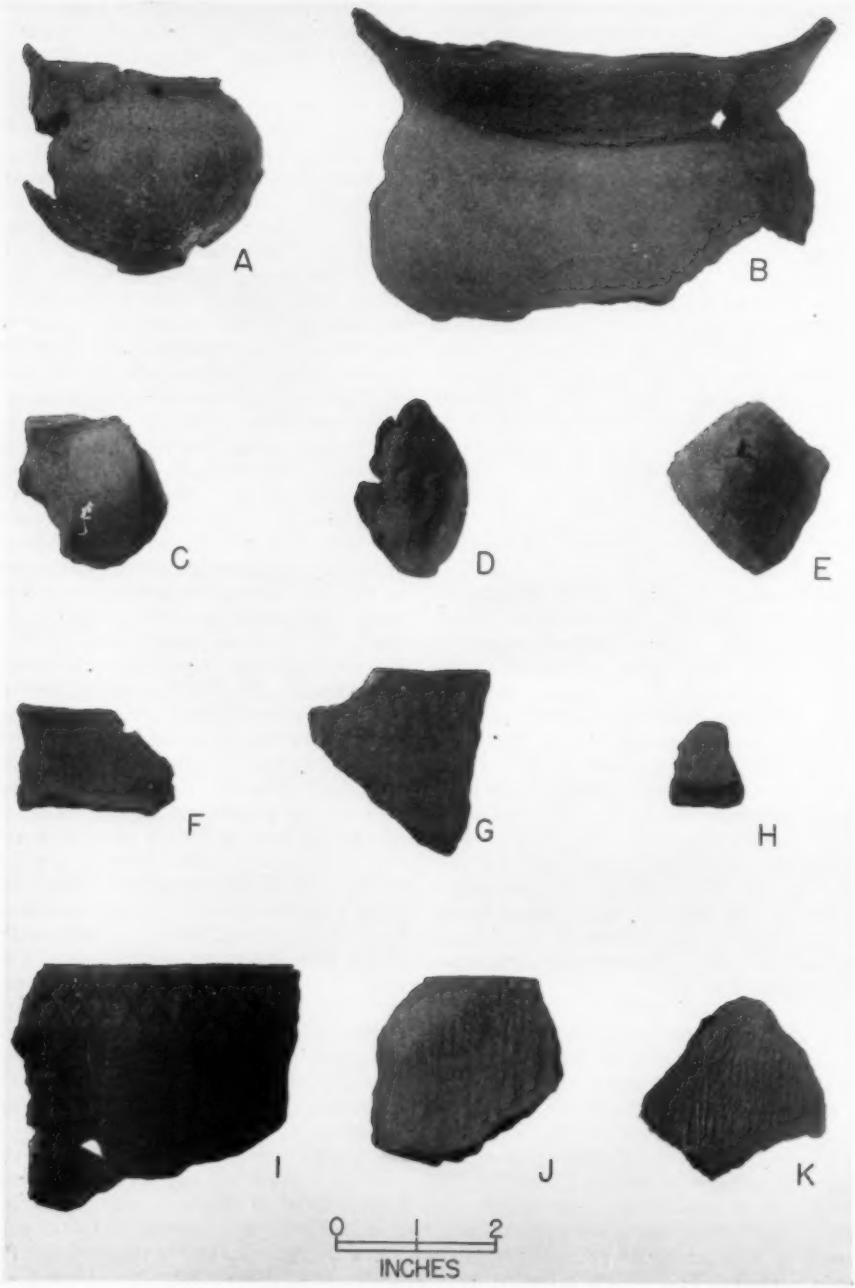


FIG. 72. Pottery from Ellsworth and Rice counties, Kansas. (See facing page for identifications.)

Republican culture found at the Elm Creek site is of the braced variety and is cord roughened (Fig. 72, H). The sherds are medium in texture, flaky in structure, and appear to be tempered with particles of shale. Two triangular projectile points with straight bases suggest assignment to the same culture. The greater prevalence of cord-roughened sherds (Little River Cord Roughened) in the deeper part of a refuse mound at the Major site suggests a carry-over of an Upper Republican ceramic trait into the Great Bend complex. Otherwise the Great Bend Aspect is without known antecedents in Kansas as far as our present knowledge extends.

A HOPEWELLIAN SITE

The Hopewellian culture is represented at the Ward site (14EW17), which is situated on a branch of Ash Creek, a tributary of the Smoky Hill River, some ten miles south of Ellsworth. Our attention was drawn to the site through the finding of rocker stamped pottery by William Leuty and by the field party of the River Basin Surveys. A limited area in a plowed field was marked by a concentration of burned fragments of Dakota sandstone and broken bison bones. When the plowed soil was stripped from the area a circular feature approximately 20 feet in diameter composed of jet-black soil was revealed.

The deposit of dark soil contained numerous fragments of sandstone which were rarely larger than the size of a man's fist. It was lenticular in cross section, being 8 inches thick at the center and tapering in all directions. The soil below it was stained as though it had been disturbed and the same coloration extended at least 5 feet to the southeast of the margin of the overlying black deposit. Within the black area four pits occurred. Two were circular; one was rectanguloid, and the other irregular in outline. All of them had rounded, basin-shaped bottoms and contained highly concentrated masses of burned sandstone, broken animal bones, traces of white ashes, charcoal, and black soil. They ranged in depth from 17 to 24 inches. One centrally situated pit had a large amount of white ashes at the bottom and was intrusive into another pit to the southwest. No traces of post molds or other features could be found. The presence of a pit used as a fireplace near the center of a circular area showing intensive human occupation suggests the former existence of a dwelling but if such ever existed it must have been of a perishable nature.

The excavations yielded two sherds of brownish black pottery heavily tempered with grit. One is a rim sherd which slopes inward above a slightly constricted neck-area (Fig. 72, I). The lip is flat and there are three exterior bosses formed by deep punctates entering from the interior surface. The surface between the bosses and the lip is covered with broad, deep incised lines arranged in a crosshatched pattern. Below the bosses on the area of the neck there is a rectanguloid plat filled with vertically oriented lines of dentate stamping, bordered on two sides by two broad incised lines which are U-shaped in profile. The other sherd is from the body of a vessel and bears an area of dentate stamping bordered by a broad incised line. There can be little doubt as to the Hopewellian affiliations of the two sherds. The rim sherd cannot be duplicated in all its features in the Kansas City Hopewell culture but the characteristics are distributed among the several varieties of sherds found by Wedel (1943).

Other artifacts from the excavations include a side notched projectile point and one which is lanceolate with a straight base; an elongate knife with a convex base, nearly parallel sides, and a rounded tip; two flake knives; three plano-convex end scrapers; two chipped disks or blanks; one quartzite chopper; several sandstone abraders; two polished splinter awls. The surface of the site yielded ten grit-tempered sherds. Eight are plain; one has large deep exterior punctates; another exhibits a zone of smooth rocker stamping. Projectile points include one with an expanded base and another which is corner notched. Two plano-convex end scrapers, a fragmentary chipped celt, and a sandstone abrader complete the list.

The Ward site offers the first definite evidence of a Hopewellian habitation site west of the 98th meridian. Wedel (1940*a*) has reported the

---

EXPLANATION OF FIG. 72. A, B, Geneseo Plain, Thompson Creek site; C, D, E, Geneseo Plain, handles, Major site; F, Little River Cord Roughened, Major site; G, Geneseo Simple Stamped, Major site; H, cord-roughened braced rim, Elm Creek site; I, incised, stamped, and bossed rim, Ward site; J, cord-roughened, belled rim, Elm Creek site; K, cord-roughened body sherd, Red Rock Canyon site. A–G, Great Bend Aspect; H, Upper Republican Aspect; I, Hopewellian Phase; J, K, Woodland Pattern.

finding of one Hopewellian sherd in association with Woodland pottery on Salt Creek in Lane County, west of the 100th meridian, where Upper Republican houses were superimposed upon a site of Woodland affiliation. Too few specimens were found at the Ward site to permit detailed comparison with material from other Hopewellian sites found in the vicinity of Kansas City. More information is needed on the nature of the Hopewellian invasion of the Plains, for if Griffin (1946, p. 67) is right, it may have contributed materially to the development of Upper Republican pottery, giving it the incised and collared rim.

WOODLAND SITES

The Elm Creek site (14EW12) is situated on the east bank of Elm Creek near its junction with the Smoky Hill River. The principal occupation is referable to a culture affiliated with the Woodland Pattern. A secondary occupation by the Upper Republican culture has been discussed above. Extensive tests made in the site failed to reveal any evidence of prolonged occupation by either culture, however. Most of the specimens were found on the surface or within the plowed soil. A thin deposit of refuse containing Woodland pottery was found at the southwestern corner of the site, whereas Upper Republican pottery was common toward the northeast on the surface and in the plowed soil. Two varieties of Woodland pottery are distinguished on the basis of tempering material. One variety contains angular particles of calcite and the other contains rounded sand grains or crushed particles of quartz. The paste of both varieties is coarse and granular. All of the sherds are cord roughened but some bear vertically oriented impressions while others bear diagonal imprints which often cross each other. Although a few sherds from neck-areas suggest flaring rims, the only rim sherds found are straight in profile with flattened lips. One sherd (Fig. 72, J) is slightly belled, suggesting the cambered rim of the Hopewellian culture. Nearly all of the projectile points are equilateral in proportions, having barbed blades and stemmed or corner notched bases. Other artifacts are less diagnostic and could belong either to a Woodland or to an Upper Republican occupation; they are plano-convex endscrapers, a chipped celt, and numerous side scrapers of shapes seemingly determined by the outline of the original flake.

The Red Rock Canyon site (14EW13) is situated on a bluff between the canyon of the same name and Elm Creek on the north side of the Smoky Hill River. The specimens seem to indicate an affiliation with the Woodland pattern. Test excavations were made in three areas where burrowing animals had unearthed flint chips and fragments of fresh water shells. Tests made with a soil auger at other places in the site failed to reveal any other concentrations of cultural material. At the southern edge of the bluff two disturbed cairns built of sandstone slabs were excavated. They had rectanguloid cists at the center. Probably they once contained burials which had been removed when loose stones had been gathered from the area for the purpose of building a stone-walled corral farther to the east. One flint chip and a fragment of a plano-convex end scraper were found in removing the soil from around the cairns.

The remainder of the site yielded pottery closely resembling that found at the Elm Creek site. The sherds are cord roughened with the impressions more often arranged vertically (Fig. 72, K) than in a criss-cross pattern. Most of the sherds are grit tempered but a few contain fragments of calcite and still others fragments of shale. The shale-tempered sherds may be Upper Republican rather than Woodland in culture. One sherd has a hole drilled through it. The only rim sherd found is straight in profile and has a rounded lip. Some of the sherds have irregular interior surfaces covered with brush marks and impressions of finger nails. No sherds definitely identifiable as Upper Republican were found.

The projectile points are typically small, averaging less than three-quarters of an inch in length, with sharp barbs and expanded stems. One has a serrated blade. They suggest the projectile points found in Hopewellian mounds along the Republican River in Kansas (Schultz and Spaulding, 1948, Pl. XXIX) in association with Hopewellian and Woodland pottery. Other artifacts include a T-shaped drill with a concave base, plano-convex end scrapers, amorphous side scrapers, a flat sandstone grinding slab, a perforated shell hoe, and a small shell pendant with two perforations.

The Woodland culture appears at more sites in the Kanopolis area than do any of the other cultures. Even so, less is known of the Woodland culture because of the meager yield of data from any one site. The projectile points and a few of the ceramic traits suggest a relationship to Hopewellian, but it is not clear whether this indicates contemporaneity of the two cultures

or whether the Woodland culture lasted long enough to receive diffused traits prior to the actual entry of Hopewellian groups into the Plains. The sites suggest the presence of small hunting and gathering groups who did not linger long at one place.

BURIAL CAIRNS

The bluffs along the Smoky Hill River were favorite places for the erection of cairns over the bodies of the dead. Unfortunately most of the cairns have been destroyed by persons who gathered stones for walls as well as by collectors of artifacts. Two cairns were investigated at the Red Rock Canyon site and our attention was directed to a group of seven cairns on the Hudson site (14EW24), which is situated on the top of a grassy butte south of the Smoky Hill River, overlooking a branch of Thompson Creek. The cairns are barely discernible in the grass, a condition which undoubtedly led to their survival. Four cairns were excavated. In one of them a flexed skeleton, crushed by the weight of the overlying rocks, was found. The cairn containing the burial was a rounded mound of Dakota sandstone measuring approximately 12 feet in diameter and 15 inches in height at the center. The base rested upon sterile subsoil but humus lapped up on the sides of the cairn to a thickness of 9 inches. The rocks forming the top of the mound were exposed to view on the surface over an area measuring 8 feet in diameter. The perimeter of the cairn was marked by flat slabs which may have been placed there to retain the small, irregular fragments of sandstone of which the cairn was composed. At the center of the cairn was a rectanguloid cist measuring approximately 66 inches from east to west and 30 inches from north to south. In a few places vertically placed slabs marked the edges of the cist but in most places the mass of sandstone fragments forming the cairn ended irregularly, giving way to the fill in the cist which was composed of dark soil mixed with rock fragments. The overlying stones had sunk into the cist and had compressed and broken the bones of a human skeleton of indeterminate sex. The skeleton rested upon its right side with the head to the east, facing north. The legs were partly flexed. The right hand rested upon the pelvic region while the left hand was at, or near, the chin. Most of the skull had disintegrated and the other bones were fragmentary. There were no artifacts associated with the burial.

The three other cairns at the site were built of larger stones and did not contain recognizable cists. Under one of them was an area of stained soil with a filled animal burrow leading into it. If any burial had been present below the cairn, burrowing mammals probably have removed all traces of it. Perhaps they were commemorative monuments or protective coverings for caches of perishable material. No artifacts or other cultural materials were found at the site. The presence of these culturally unidentifiable cairns in the area suggests the westward extension of mound building, but the lack of artifacts precludes identification of the cairns with any known cultural complex.

SUMMARY AND CONCLUSIONS

A study of the archaeological remains from Ellsworth and Rice counties, Kansas, reveals a progression of cultural complexes which occupied the area on different time levels. Generally speaking, the cultures contrast sharply with each other and very little evidence of transition from one to the other is present. Thus far there are no data on preceramic cultures in the area studied. Although the burial cairns which were excavated are devoid of artifacts they probably will be linked with a pottery-using culture when more work has been done.

Sites attributable to the Woodland Pattern are common in the area but produce few specimens and therefore do not lend themselves to further classification at this time. The distribution of the Hopewellian Phase is now extended west of the 98th meridian but the sites are rare, suggesting a brief period of occupancy. Sites of the Upper Republican Aspect are fairly common but no earth-lodge remains were found. The Great Bend Aspect is well represented in Rice County. The discovery of a Great Bend camp site on Thompson Creek extends the known distribution of the complex farther north and west than previously known. The stratigraphy at the Major site implies that it will be possible to arrange many of the Great Bend sites in chronological order, thus giving us time perspective within the culture. The identification of the sherds from the Rio Grande pueblos adds additional support to the dates arrived at by Wedel (1947*a*). The data gathered from the Indian Hill petroglyph site will be of greater comparative value when other petroglyph sites in the Plains are reported on.

Using Wedel's dates for the ceramic cultures, we find that the area covered by Ellsworth and Rice counties was occupied from approximately 1000 A.D. on. The earliest cultures are those

affiliated with the Woodland Pattern. Toward the close of the twelfth century, Hopewellian groups had ventured into the area. The Upper Republican Aspect may have been present as early as the beginning of the thirteenth century. The cord-roughened sherds in the Great Bend culture suggest contact with, or a genesis in, the Upper Republican culture. No data establishing contemporaneity are present. The Great Bend Aspect must have existed from the late fifteenth until the latter part of the seventeenth century. Data on the occupation of the area by bison-hunting nomads are limited archaeologically to petroglyphs showing men riding horses. The last aboriginal occupation was that of the Cheyenne and Arapaho, which extended into the last half of the nineteenth century.

Museum of Natural History
University of Kansas
Lawrence, Kansas

RECENT INVESTIGATIONS IN FORT RANDALL AND OAHE RESERVOIRS, SOUTH DAKOTA

PAUL L. COOPER

ONE of the consequences of the Missouri Basin development program will be the virtual obliteration of the Missouri River between Yankton, South Dakota, and the Montana-North Dakota line. The lakes to be created by the various dams proposed or under construction by the Army Corps of Engineers will inundate all but short stretches of the terraces on which are situated literally hundreds of fortified and unfortified earth-lodge villages and other, earlier, occupational sites. Situated near the northern limit of agriculture but heavily populated by sedentary, horticultural people for a period of several hundreds of years, this anthropologically fascinating area has been barely touched scientifically. Along this great waterway, which loomed so large in the history of the movements of peoples stimulated by the encroachment of European civilization and which appears to have been the home at various times of groups with widely differing economies, lie the answers to many tantalizing and important problems and yet, while the area has not been wholly ignored, investigations to date have been on a small scale—the collection of surface materials and extremely limited excavation in a small number of sites (cf. Strong, 1940; Will and Hecker, 1944). The time available for the gathering of the data from which the history of the region can be reconstructed is tragically short. Two of the larger dams—Garrison and Fort Randall—are under construction and the largest of all—Oahe—is nearing the construction phase.

This is a preliminary report of progress on the archaeological salvage program of the Missouri River Basin Survey as it relates to that portion of the mainstem of the Missouri River which will be affected by the construction of the Fort Randall and Oahe dams. Archaeological inferences drawn must in the main be highly tentative and largely impressionistic because of the nature, scope, and recency of the work accomplished in the area to date by the Survey. Investigation by this agency has consisted largely of brief and hence superficial reconnaissance of segments of the river banks scheduled for inundation, interspersed with a limited amount of test excavation in a few sites as time and resources permitted. Relatively complete investigation has been possible only for two small components, one of them threatened with imminent destruction by dam-building activities. Where survey has been limited to examination of the surface of sites, the data collected and recorded are so uneven that comparisons on a broad scale are difficult. For example, sites which have never been cultivated are likely to reveal much as to community arrangement and defensive structures but yield almost no pottery, while the reverse may be true in the case of sites which have been farmed. Finally, exhaustive analysis of the data recovered to date has not yet been possible, since the field work on which this report is based has continued almost to the date of writing. In this paper, therefore, we shall confine ourselves to an abbreviated description of the investigations accomplished by the Survey and of the more significant sites recorded, together with what cultural statements seem justified on the basis of a cursory inspection of artifact—mainly pottery—collections. Non-pottery artifacts have been for the most part ignored, because they are always rare and frequently non-existent in

our surface collections and hence would contribute little to the present attempt to group and compare various sites.

During the first brief season of field work by the Missouri River Basin Survey, the section of the mainstem in question received no attention other than a very brief visit to the immediate vicinity of the Fort Randall dam site, in September, 1946. From June 3 to July 18, 1947 a party of four—J. J. Bauxar, Robert L. Hall, Warren L. Wittry, and the writer—made a rapid surface survey of that portion of the Fort Randall Reservoir area lying between the dam site and Fort Thompson, approximately 110 miles apart by river. The upper 35 to 40 miles of the reservoir, including the Big Bend of the Missouri, have not yet been visited. Ninety-three sites were recorded by the survey party, and the University of South Dakota has records of nine sites in the reservoir area above Fort Thompson.[1]

From July 19 to November 1, 1947, test excavations were undertaken in four sites on the east side of the river in the lower part of the reservoir. Test trenches in two mounds (39CH4) on a low terrace in Wheeler Bottom led to rather comprehensive excavation when extensive burial features were uncovered. At Site 39CH5, near the mouth of Pease Creek, several test trenches were excavated in the general occupational area and a trench was carried across a mound at the edge of the terrace on which the site stands. All revealed two levels containing limited quantities of cultural material. Shortly before completion of work at this site Hall and Wittry left the party to return to school. Two narrow trenches were next carried short distances through a small occupational site, 39CH29, on the edge of a terrace where Benge Creek enters the Missouri River about a half mile above Wheeler Bridge. The final three weeks of the 1947 field season were devoted to excavation in the Oldham site (39CH7), a fortified earth-lodge village near the mouth of Platte Creek. A maximum of five local men were employed for this work.

Archaeological investigation by the Survey in the Oahe Reservoir, which will extend some 250 miles upstream from a dam to be constructed 6 miles above Pierre, has been confined to a period of less than six weeks during the latter part of the summer of 1948. The party varied in composition but during most of this time it consisted of Dorothy E. Fraser, Robert L. Hall, Gordon F. McKenzie, Warren L. Wittry, and the writer. Most of the west side of the river from the vicinity of the dam site to the mouth of the Cheyenne River, a distance of about 45 miles, was reconnoitered and minor test excavations, mainly for the purpose of collecting *in situ* artifact samples, were accomplished in nine sites—39ST1, 39ST4, 39ST12, 39ST21, 39ST23, 39ST25, 39ST26, 39ST49, and 39ST50—near Fort Bennett and the mouth of the Cheyenne River. The reconnaissance party visited 41 sites on the west side of the river and recorded five others in the same area reported to it but to which access was unusually difficult or which for other reasons were by-passed during the limited time available. In addition, a site on the east end of the proposed dam axis was examined. Most of these sites had been previously recorded,[2] but several others were apparently discovered, at least as far as institutional records are concerned, by our survey. The Missouri River Basin Survey has given no systematic attention to the remainder of the vast Oahe Reservoir area, although scores of sites are known to exist therein.[3]

During a two-week period ending November 24, 1948, a burial mound (39CH9) in the spillway area of the Fort Randall dam was completely excavated under supervision of the writer with the assistance of J. M. Shippee of the River Basin Surveys and a single local worker. The Corps of Engineers provided earth-moving machinery and an operator, as well as surveying and other assistance.

Before we proceed to a description of the archaeological remains, a word regarding documentary and traditional evidence of occupation

[1] A considerable number of the 93 sites visited by the Survey were also previously known to the University of South Dakota Museum, whose director, Dr. W. H. Over, generously supplied us with location information. Access to collections from sites along the river was also granted.

[2] Site lists were made available to the Survey by the University of South Dakota Museum. There are also published references to certain of the sites: Strong, 1940; Will, 1924.

[3] Lists of sites on record in the University of South Dakota Museum. Will and Hecker (1944) list sites on the Missouri River above the mouth of the Grand River, and Strong (1940) describes archaeological research in certain villages near the Grand River and below the Cheyenne River. The University of North Dakota has investigated a site on the Standing Rock Reservation, but there is as yet no published account of the findings.

of the area is in order. A comprehensive discussion of these important and complex data is not possible here, partly because of limitations of space but mainly because the writer has not yet made an exhaustive study of the pertinent literature.[4]

According to traditions of the respective tribes or of other groups who claimed knowledge of them, the Mandan, Iowa, Omaha, and Ponca were all resident at one time or another on the Missouri River between Fort Randall and the mouth of the Cheyenne River. The Mandan, we are told, reached the Missouri at the mouth of the White River and, after residing for some time in the vicinity of the Bad River, among other places, moved northward out of the area with which we are concerned at the moment (Will and Spinden, 1906, p. 99; Will, 1924, pp. 305–6). The Omaha, Ponca, and Iowa together, according to one version of Omaha tradition, moved up the Missouri River from the vicinity of Lake Andes to the mouth of the White River, where they remained awhile before moving downstream to Bow Creek in Nebraska and other, lower, sites (Dorsey, 1884, pp. 212–13). It is alleged that during part of their sojourn on the Missouri River they were in contact with the Arikara (Fletcher and La Flesche, 1911, p. 75). The Cheyenne, according to Dakota tradition, occupied villages farther upstream in the vicinity of Fort Yates, before they moved on toward the Black Hills to become the bison hunters they were by the time Lewis and Clark ascended the Missouri (Will, 1924, p. 305; Grinnell, 1923, pp. 23–5). The Yankton and Teton Dakota apparently reached the river during the eighteenth century.

References to Arikara villages in the area are numerous. Possibly the first recorded White contact with a village of this tribe was the visit of the Chevalier Verendrye, who in March of 1743 arrived at the "fort" of the Gens de la Petite Cerise. It was here Verendrye placed the lead tablet with which a plaque reportedly found on a hill overlooking Fort Pierre has been identified. He mentions only one community of these people and en route to the Mandan villages he apparently encountered no Indians other than a single band of "Prairie Sioux" (Burpee, 1927, pp 426–9). Will (1924, p. 302) has asserted that Arikara villages near the Bad River appear to have been abandoned about 1770, and that Trudeau found them near the mouth of the Cheyenne River in 1795. Strong appears to agree with Will's interpretation of Trudeau's journal, while the editor of that journal places the Arikara near the mouth of the Grand River in that year (Anonymous, 1914, p. 48). Lewis and Clark found this tribe near the Grand River in 1804, but noted sites of former villages in the area of our survey. One of these, stated to have been occupied five years earlier by the Arikara, was located above the mouth of No Timber Creek, commonly identified as the present-day Chantier Creek (Thwaites, 1904, p. 172). Another was on the west side of the river opposite the lower end of an island whose upper end was two miles below the mouth of the Cheyenne River (*op. cit.*, p. 175). A reference by Maximilian to a former village of the Arikara across the river from Fort Lookout and probably in Brule County, is the farthest downstream location for which we have found any mention of Arikara residence (Thwaites, 1906, p. 303).

Many of the 139 sites recorded to date by the Survey are represented in our collections by so few specimens that no statement as to cultural affiliation can be made. In some instances the paucity of materials reflects the nature of the occupation, in others it is apparently the result simply of the lack of cultivation, erosion, or other factors which expose sub-surface materials. Sites from which diagnostic artifacts are lacking but which are evidently earth-lodge villages will be briefly mentioned, but sites which neither have produced diagnostic artifacts nor exhibit significant surface features will not be considered.

It is apparent from our brief examination of the relatively small cultural sample in the Survey's possession that, although there are certain very general similarities throughout the area—use of grit for tempering, for example—at least three kinds of pottery are well represented in the area of the proposed Fort Randall Reservoir and in the lower part of the proposed Oahe Reservoir; other kinds are now known at only one or two sites, but may eventually be found more widely distributed. Additional research will almost inevitably reveal also that some of the collections now tentatively grouped together into a single one of our hesitantly

[4] The archaeological collections and the files of the Cross-Cultural Survey of the Laboratory of Anthropology, University of Nebraska, were consulted during the preparation of this paper.

defined categories actually belong in distinct groups.[5]

Pottery from several sites between Pierre and the mouth of the Cheyenne River is apparently identifiable with Arikara ceramics as described by Strong (1940, pp. 368–9, 381).[6] The majority of rims in our collections, designated Category A, are everted or thickened to create a relatively narrow band (Fig. 73: 1–5) which is usually decorated but is occasionally plain. Decoration consists of horizontal (Fig 73: 2), diagonal (Fig. 73: 5), or vertical cord impressions, or of vertical (Fig. 73: 3) or diagonal (Fig 73: 4) incisions or impressions with a stick. Everted rims frequently bear strap handles (Fig. 73: 2) or tabs (Fig 73: 4, 5). Simple flaring rims, frequently fairly high and straight, constitute a minority group. These are either undecorated or are decorated with incisions or impressions only on the lip; occasionally the outer rim surface bears vertical simple stamping.[7] Both thickened and unthickened rims are occasionally modified with the fingers to produce an undulate appearance when viewed from above. Necks of Category A vessels are often combed or brushed, usually vertically (Fig. 73: 1–4), and all bodies are smooth or simple stamped.

This complex is characteristic of the fortified part of the Lower Cheyenne River site (39ST1), which Strong (1940, pp. 380–1) suggests was visited by Trudeau in 1795; of the Buffalo Pasture site (39ST6), in which a Columbia University party in 1939 carried out limited excavation (*op cit.*, p. 381); and of sites 39ST25, 39ST47, 39ST50, 39ST51, and 39HU22. Pottery of this kind was also collected from the surface of 39ST5, where it occurred with a minority of sherds of Category B, to be discussed next; from 39ST12, where there is a hint of its stratigraphic position above pottery of Category B and cord-marked pottery; and from 39ST23, together with sherds of Category B. Sites 39ST1, 39ST6, 39ST12, 39ST23, 39ST25, and 39ST50 are in uncultivated land and at each, house pits and an enclosing ditch can be seen. 39ST1 is at the mouth of the Cheyenne River, 39ST6 is near the Oahe dam site about 6 miles above Fort Pierre, and 39ST12, 39ST23, 39ST25, and 39ST50 lie from about 2 to 9 miles below the Cheyenne River. Site 39HU22, which will be covered by the east end of the Oahe dam, is marked by depressions but lacks any surface evidence of a moat. At Site 39ST5, no signs of a ditch or of pits were observed, although the surface has apparently never been broken and specimens were found in some profusion along the terrace edge. The original nature of this site is of considerable interest, since it would appear to be a likely spot for the Arikara village above the mouth of No Timber Creek which Lewis and Clark reported had been occupied five years earlier (Thwaites, 1904, p. 172). 39ST5 is situated slightly less than 3 miles above the mouth of the present Chantier Creek, a small stream in a presently treeless valley which has been identified with No Timber Creek, and, to judge from the artifact sample collected, contains pottery which is predominantly Arikara-like.

The next defined pottery complex to be considered is represented in our collections by samples from 16 sites between the mouth of the Cheyenne River and a point a few miles below Oacoma, an air distance of about 95 miles. Thirteen of these sites are in Stanley County above Fort Pierre, two are near Oacoma in Lyman County, and one is on the east side of the river at the northern edge of Brule County a few miles above Chamberlain. The predominant pottery recovered from these sites, Category B, is gray to buff, rather thin, and fairly hard. The rims flare, but are straight and usually fairly uniform in thickness from neck to lip. The lips are incised or impressed in a variety of ways and the outer surface of the rim characteristically bears a series of incised or trailed horizontal lines. It appears that the bodies of vessels with rims of this kind are smooth or simple stamped and are frequently decorated by incising, probably on the shoulder area. In the collections in which category B pottery predominates there are small numbers of collared rims of rather varied form and deco-

[5] No attempt is made here to establish pottery types. The categories simply include sherds which are considered sufficiently similar to be thrown together for the descriptive purposes of this paper. When time will have been available for additional study of the pottery, the categories will undoubtedly be quite different.

[6] Strong's identification of historic Arikara ceramics is based on collections from the well-documented Leavenworth site near the Grand River.

[7] By this term is meant the ridged and grooved surface found on Plains pottery and variously described as grooved paddle marking, thong-wrapped paddle marking, etc. The straight, high rims with vertical simple stamping are discussed under category C, below.

ration and even fewer sherds with high straight rims decorated only on the lip. These latter rims, which predominate in the complex to be discussed next and are designated Category C, frequently bear vertical simple stamping on their outer surfaces.

Category B and associated pottery are found generally at sites which are marked by sizeable depressions in the surface but exhibit no evidence of fortification. The sites vary greatly in size; they contain from three to several dozen depressions or are merely small pottery-bearing areas in which no surface features are discernible. One component, including approximately 30 visible house pits, is immediately adjacent to a fortified unit mentioned earlier which yields Arikara pottery; the two components are included under a single number, 39ST1. It appears that part of the component under discussion may underlie the fortified settlement, although no direct evidence of this has apparently been observed. House pits thickly distributed along a ridge above Fort Bennett for a distance of considerably more than a mile may constitute a single huge village, for small test pits at two widely separated points on the ridge produced pottery of category B and no physical distinction could be observed in the field. For convenience, however, two numbers—39ST4 and 39ST49—have been assigned to two arbitrarily defined areas of the site.[8]

Category B pottery is especially intriguing because of the wide distribution of its decorative elements. A series of incised or trailed horizontal lines on the exterior rim surface associated with transverse or diagonal incised or impressed lines on the lip or short diagonal incisions at the upper edge of the outer rim is found on pottery from many sites along the Missouri River and far to the south and southwest. It is difficult to believe these various occurrences do not usually reflect some sort of typological relationship, although there appears to be a considerable amount of variation in technique of application of the design and in the ware upon which the design is applied. Sherds so decorated have been reported from northeastern Wyoming and northern Nebraska by Wedel (1940*b*, pp. 323–4; 1947*b*), who suggests that pottery from the southern Black Hills described by Buker (1937) may be related. Apropos of this latter possibility, a Missouri River Basin Survey party recovered thin, hard pottery with horizontally incised exterior rim, decorated lip, and incised body in Angostura Reservoir near Hot Springs, South Dakota, during this past summer (J. T. Hughes, personal communication). A sherd from Ash Hollow Cave in southwestern Nebraska bears a somewhat similar decoration, but is apparently otherwise quite unlike the pottery with which we are concerned (Champe, 1946, Pl. 9: 5 and pp. 113–14). Sherds found in Upper Republican sites in the Medicine Creek Reservoir in southern Nebraska likewise resemble our material mainly in decorative motif (M. F. Kivett, personal communication). A private collection from the proposed Amherst Reservoir in south central Nebraska, on loan to the Missouri River Basin Survey, contains rim sherds which are most often fairly thick and curve outward from the neck, but whose exterior surface bears a series of horizontal lines, either trailed or cord-impressed. Diagonal incisions commonly occur on the lip or on the outer rim immediately below the lip. Much closer resemblances exist between the horizontally incised rims of Category B in the Oahe Reservoir and upper Fort Randall Reservoir and of pottery from certain sites in northeastern Nebraska.[9] Sherds from 39ST1 at the mouth of the Cheyenne River and from Minaric II at the confluence of Ponca Creek with the Missouri River are virtually identical, except that bone fragments occur as tempering material in the latter in contrast to the grit tempering material of the former.

Proceeding to sites which are closer geographically to the area of our investigation, several which have been reported apparently have pottery like that under consideration. The ceramics of the Arzberger site, a fortified village on the east side of the Missouri River a few miles below Pierre, are described by Strong as having both cord-marked and simple stamped surfaces and incised and punctate decoration. Collars and handles are also char-

[8] Other sites with Category B pottery which have been recorded by the Survey are 39ST5, where a relatively minor quantity was found on the surface with Arikara pottery; 39ST12 and 39ST23, where it is found with Category A pottery; 39BR10, where the predominant pottery is assignable to Category C; and 39LM24, 39LM31, 39ST10, 39ST21, 39ST26, 39ST27, 39ST34, 39ST35, 39ST36, 39ST40, and 39ST42. For a few of these sites the quantity of pottery recovered is exceedingly small; it is conceivable that further collection would demonstrate that the present samples represent minority types at some sites.

[9] Redbird sites in Holt County and Minaric sites in Knox County, excavated by the University of Nebraska, Laboratory of Anthropology.

acteristic of the pottery here, but it is apparent that horizontally incised, unthickened rims also occur, although perhaps in small numbers (Strong, 1940, Pl. 10, D). The La Roche site, a village on the west side of the Missouri River in southern Stanley County, is related in some way to sites found farther upstream, judging from the description and illustrations of pottery in Meleen's report of the complex. "Bands of horizontal lines encircling the rim," presumably as illustrated in his Plate II: 4, 5, 8, 10, and 11, "are found on 56% of the sherds" (Meleen, 1948, p. 22). Without a comparison of relatively complete complexes, statements regarding the relationships of sites are of course fraught with peril, but it is tempting to suggest, on the basis of apparent pottery similarities and the fact that houses at the La Roche site are loosely arranged without fortification, that La Roche and the unfortified part of 39ST1, for example, are fairly closely related. The Scalp Creek site, not far above the Fort Randall dam site in Gregory County, has been excavated by the University of South Dakota but is unreported except that it is included in a trait comparison table in the report on the La Roche site (Meleen, 1948, pp. 28–30). This site is stratified;[10] the lower level will be mentioned later, but the upper occupation apparently resembles that at La Roche. Differences include the presence of a defensive ditch at Scalp Creek, as well as the presence of handles on pottery vessels. I have seen horizontally incised rims in the collection from this site, but do not know in what numbers they are present.

Meleen has concluded that the La Roche and Scalp Creek sites are fairly closely related to the Lower Loup Focus of Nebraska and has suggested that the occupants may have been the ancestors of the Arikara, who were found well upstream at the time of the earliest known recorded contact by Whites. The suggestion of close resemblances between the pottery of the La Roche site and Minaric II engenders the hope that the latter site will be reported in the not too distant future. Will has indicated cutting dates of 1434, 1438, 1448, and 1457 (all plus 5–10 years) for four wood specimens from the site (Meleen, 1948, p. 31).

The unfortified Demery site, on the west side of the Missouri River at the boundary between North Dakota and South Dakota, has been identified by Will and Hecker (1944, p. 88) as the location of "Arikara from the west side of the river . . . when some or all of the east side Arikara lived in the Mandan neighborhood prior to 1796." It is asserted that pottery of this site shows evidence of close relationship to that of the Leavenworth site (*op. cit.*, p. 42), but the description which follows this assertion indicates that only about 10 per cent of rims are thickened or everted and suggests that 175 of 450 rims have incised outer rim and incised or impressed lip decoration. In a small collection from this site in the possession of the Survey, almost every rim bears several horizontal incised lines on the exterior surface of the rim. This pottery bears little resemblance to that described for the Leavenworth site by Strong (1940, pp. 368–9 and Pl. 7).

In the present state of knowledge, speculation as to the authorship of Category B pottery is probably futile. The characteristic combination of decorative elements has been noted under conditions which suggest a fairly extended time span—from Upper Republican time to the period of European contact. The occurrences in Upper Republican sites are few, however, and the specimens differ considerably from those in the Oahe Reservoir area and at Minaric II; metal appears to have been found at the latter site, but the question of association with the aboriginal materials probably cannot be answered until a careful study of field records has been made. The manifestations in the area in which we are primarily interested at the moment and those which most closely resemble them are probably referable to a relatively late date—late prehistoric or early protohistoric, as Wedel (1947*b*, p. 159) has suggested. The known distribution is compatible with Meleen's and Will and Hecker's assignment to Arikara except for the time factor. The dates indicated for the Demery site and the La Roche site are more than 300 years apart; this is a long time span if the ceramics of the two sites are actually closely similar. Assignment of the Demery site to Arikara of the late eighteenth century implies either extremely rapid cultural change in the brief period before occupation of the Leavenworth site or pronounced differences between villages. If identification of sites in the vicinity of the Cheyenne River and of such other sites as Buffalo Pasture with Arikara is correct, and there seems little doubt of this, then either such differences existed or the Demery identi-

[10] E. E. Meleen, personal communication, and records and specimens on file in the University of South Dakota Museum.

fication is incorrect. If pronounced village differences did not exist and the suggested date for the Demery site will not stand, the suggestion of an Arikara authorship for the pottery complex in question faces another difficulty; the La Roche date of about 1450 and the distribution of an identical or closely similar complex as far upstream as the Cheyenne River, and perhaps even as far as the North Dakota line, would require revision of the widely accepted interpretation of Arikara history. Strong (1940, p. 359) has summed up this interpretation thus: "... one thing stands out—that is, their constant northward movement up the Missouri. ..."[11]

As to other tribes which tradition or historical evidence have placed in the area at one time or another, the Iowa and the Omaha seem out of the question, since the former has been tentatively identified with the Orr Focus of the Oneota Aspect (Mott, 1938, p. 303), and Great Oasis pottery[12] has been found in 25DK10, a cemetery believed to be associated with the Large Village of the Omaha near Homer, Nebraska (Wilford, 1945, pp. 35–6, Fig. 3, *a*),[11] and in what may well prove to be the Bad Village of the Omaha, near Wynot, Nebraska (J. L. Champe, personal communication). The Minaric sites, previously mentioned, are situated in the vicinity of documented Ponca locations.[13] On the other hand, evidence is lacking that the Ponca were ever on the Missouri as far upstream as the Cheyenne River, where sites—some very large—containing pottery with horizontally incised rims are numerous. Finally, our ceramic complex cannot be equated with the Mandan without some revision of opinion as to the cultural history of this tribe. For one thing, it has been commonly supposed that the Mandan reached the Missouri River from the east at the mouth of the White River. Moreover, at the Huff site—Middle Mandan according to Will and Hecker (1944, p. 49)—the earliest cutting date among those obtained from eleven timbers was 1485 (Will, 1946, p. 16), only about 35 years earlier than the tree-ring dates for the La Roche site. The ceramics from the two sites appear to be very unlike.

It is apparent that the question of the authorship of Category B pottery must be left open for the present. All the tribes resident in the general area in historic times are not necessarily eliminated from consideration, but it might be well to consider the possibility that some hitherto quite unsuspected group may have been responsible for the occupation.

The third pottery complex to be found at several sites in the area involved is characterized by a preponderance of high, straight (but flaring) rims, most often bearing vertical or nearly vertical simple stamping on the outer surface, which lack decoration except for incised or impressed lines on the lip (Fig. 73: 6, 7). The pottery with this kind of rim is designated Category C. The lip designs are of considerable variety; they include diagonal and transverse lines, chevrons, and punctations of various shapes. Bodies of vessels appear to be usually simple stamped. Other rim forms in collections from the sites in which Category C occurs in large numbers are simple and recurved or straight, or are collared, the collar most often being created by channeling of the interior rim surface. Collars are commonly decorated with incised chevrons (Fig. 73: 8) or opposed groups of diagonal lines, or are plain except for a scalloped effect at the base.

Bodies are incised in a few instances; usually it is impossible to determine with what kind of rim this decoration is associated, but in one case (Fig. 73: 9) the rim is straight and flaring. Handles, as on this same sherd, are rare.

This complex is represented in the upper level of the fortified Oldham site (39CH7), where limited excavation revealed two round house patterns associated with this same level;[14] in 39CH45, where house pits are visible but no ditch could be discerned; and in 39BF4, 39LM26, 39LM27, and 39LM28, all modified by cultivation. A small collection from 39LM25, an unfortified earth-lodge village, suggests that the pottery of the site will fall into this cate-

[11] See also Strong's summary reconstruction of this movement from the Nebraska-South Dakota line to the Arikara's final residence on the Fort Berthold reservation; *op. cit.*, pp. 359–60.

[12] The decorative treatment of the characteristic Great Oasis rim and that of category B shows a general resemblance, but the Great Oasis rim is characterized by a unique and very specific combination of elements lacking in the other.

[13] For example, Trudeau in 1794 located a Ponca village on the Missouri River a league above the Niobrara. Anonymous, 1914, p. 413.

[14] A lower horizon in this site yielded a small quantity of cultural material. The sherds recovered are so few that no characterization of them is possible beyond the statement that they are grit tempered and cord marked.

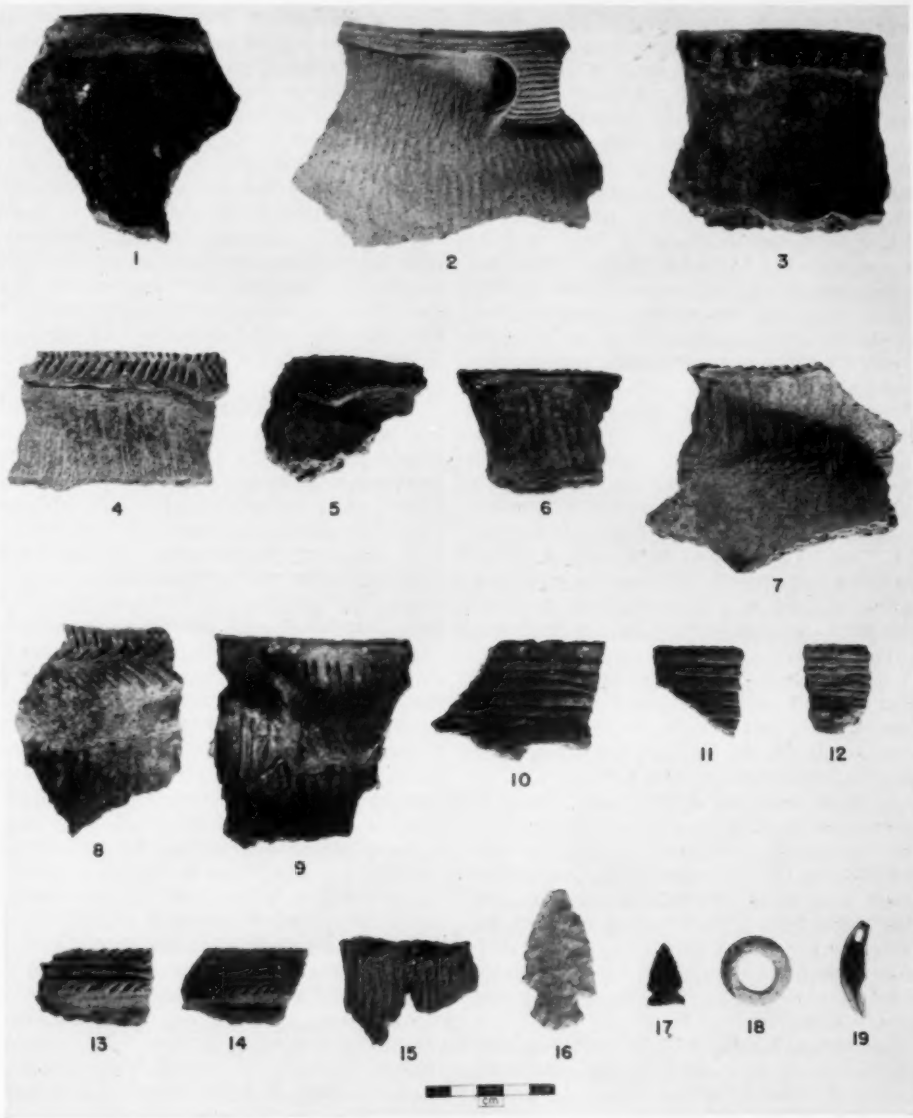


FIG. 73. Artifacts from various sites on the Missouri River in South Dakota. 1–5, sherds of Category A; 6, 7, sherds of Category C; 8, 9, sherds resembling Lower Loup pottery; 10–12, sherds of Category B; 13, 14, Upper Republican-like sherds from Site 39BR13; 15, Woodland sherd from Site 39BR11; 16, 17, 19, points and perforated canine tooth from Site 39CH9; 18, shell object from Site 39CH4.

gory. Among the sherds from 39BR10, which consists of house pits and a detached ditch-enclosed area without evidence of habitations, were many of Category C and a few of Category B. The collection from the cultivated surface of 39BR13 includes pottery of Category C and, in approximately equal numbers, sherds of vessels with collared rims which are decorated with horizontal incised lines and with short diagonals at the lower and/or upper margins of the collar (Fig. 73:13,14). The bodies of these latter vessels are cord marked. This pottery closely resembles that recently recovered from Upper Republican Aspect sites in Medicine Creek Reservoir, Nebraska. Interestingly enough, the sherds from 39BR13, a few miles above Chamberlain, South Dakota, bear a much closer resemblance to Upper Republican pottery of southern Nebraska than to pottery of the St. Helena Focus of the same aspect, despite the fact that sites of the latter focus occur on the Missouri River less than 150 miles distant (cf. Cooper, 1936, Pls. 8–11). Other sherds include a rim with multiple handles suggesting certain pottery of the Lower Loup focus in Nebraska and a few other handle fragments.

The relationships of the pottery of Category C are not clear. The known sites in which it predominates are confined, in the area of our investigation, to the upper two-thirds of the Fort Randall Reservoir area. It is represented by occasional sherds in other sites, such as the unfortified part of 39ST1, and somewhat similar sherds have been noted in collections from Lower Loup sites and the Minaric sites in Nebraska, but I have seen no collection elsewhere in which it is abundant. There is, however, a suggestion of contemporaneity or near-contemporaneity with Lower Loup, since some of the associated pottery appears to resemble closely that from such sites as Burkett and Gray-Wolf in Nebraska.[15]

The Survey has visited fourteen earth-lodge villages which have not yet been considered because little or no artifact material was collected from them. It is probable that most if not all of them will be found to be related to one or another of the groups previously discussed. Five of these sites—39BF10, 39BR15, 39ST14, 39ST41, and 39ST45—are fortified, and three of these are of especial interest. 39ST14, the Scotty Philips Ranch site, is a compact, distinctly marked, ditch-enclosed group of house pits lying in what will be the work area of the Oahe dam site. 39BF10, the Crow Creek site, is a large village of earth lodge depressions surrounded by a deep, zigzag ditch, and 39ST45 is the only site in the area surveyed to date which has a ditch with clearly defined bastions. The last-named site resembles the Arzberger site, reported by Strong (1940, p. 382), in the nature of the encircling ditch and in the indistinct character of surface features within the ditch. It is, however, much smaller than that site. The nine remaining sites, all unfortified, contain house pits numbering from about a half dozen, as at 39ST37, to several dozen, as at 39ST15.

39CH5, a site not far above the Fort Randall dam which reveals evidence of two occupations, should be mentioned because of its potential importance, although little can be said about it until additional work has been accomplished there. Two culture-bearing strata, usually very thin, are separated by a layer of fine sterile material. Both strata are represented in a mound which was created by a deposit more than 4 feet thick associated with the lower occupation. Artifacts were not abundant in either layer in our trenches, but they were especially rare in the upper one. In the lower deposit, simple-stamped sherds somewhat resembling the pottery of Category C from farther upriver were found with sherds of cord-marked vessels with collared rims identical to those found at 39BR13 and apparently related to Upper Republican wares in southern Nebraska. Fragments of a vessel with polished black surface and a chevron design executed in broad trailed lines on the flattish shoulder area were also found in this layer. Material from the upper level is exceedingly scarce but most of the sherds of a single pot with simple-stamped body, crudely incised shoulder area and outer rim surface, and flattened and diagonally incised lip were recovered. The motif on the outer rim is like that of our Category B. No evidence of structures was noted in our limited trenches.

Trenches excavated in 39CH29, a small occupational site on a cultivated terrace a few miles above 39CH5, produced only a small number of artifacts. The combination of pottery traits is not comparable to any complex known for the area, although some individual sherds closely resemble pottery from other sites. Characterization of the complex represented at the site is not now possible because there are

[15] Compare, for example, our Fig. 73: 9 and Dunlevy, 1936, Pl. 8, F.

scarcely any repetitions of form or decorative treatment; almost every rim sherd is unique within the collection. One rim sherd is similar to certain St. Helena focus sherds, two appear to be like Great Oasis material, and a few bear a general resemblance to Nebraska culture forms.

Woodland components recorded by the Survey are represented by a surface collection from 39GR5, on the site of the military Fort Randall; by a buried stratum at 39BR11, in the northern edge of Chanberlain; and by two burial mound sites, 39CH4 and 39CH9, both excavated.

A handful of pottery from 39GR5 includes relatively thick sherds with surfaces bearing parallel cord marking and with very slightly flaring rims. A row of bosses created by punching from the interior encircles the outer rim approximately an inch below the rounded lip. These sherds resemble sherds from the lower level of the Scalp Creek site, about 10 miles distant. At this site, excavated by the University of South Dakota Museum, sherds of this sort were associated with others bearing horizontal lines and inverted triangles created by impressing the clay with a single cord or cord-wrapped rod. This material is similar to collections from the Eagle Creek site, 25HT1, in northeastern Nebraska (Hill and Kivett, 1941, Pls. XXVII, XXVIII).[16]

At 39BR11 the walls of a borrow pit were cut slightly to reveal a cultural layer buried beneath a foot and more of a sterile silty deposit. The very small number of sherds recovered are grit tempered and cord marked and include one rim piece, which is straight, vertically cord marked, and decorated with the impressions of a cord-wrapped rod. The impressions lie diagonally across the outer edge of the lip (Fig. 73: 15). Similar sherds are reported from the Sondergaard site in Howard County, Nebraska (Hill and Kivett, 1941, p. 216, Pl. XIX: 1, 1).

Two low mounds, 39CH4, in a cultivated field between the Fort Randall dam site and the Wheeler Bridge were excavated by the Survey in the summer of 1947. Each proved to cover a rectanguloid pit containing secondary burials; Mound 1 contained in addition, near the top, a secondary burial of three individuals. A prepared clay floor lay at the base of Mound 1, and traces of wood suggest that the submound pit was originally covered with timbers. Two bundle burials and the haphazardly deposited remains of at least three other individuals lay on the floor of the pit. The larger long bones of one of the bundle burials had been neatly perforated, a feature somewhat reminiscent of treatment of bones at the Younge site (Greenman, 1937). There were no artifacts associated with the burials, but a few were found in the mound fill. These included about a half dozen predominantly thick, cord-marked sherds and a few circular, plano-convex shell objects about an inch in diameter with a central hole about $\frac{1}{3}$ inch across (Fig. 73: 18). Mound 2 covered a pit which contained the bones of several individuals deposited in no apparent order. Apparently the only artifact found in this mound is part of a large stemmed projectile point which lay within a fragmentary skull.

39CH9, in the spillway area of the Fort Randall dam, resembled 39CH4 to some extent in that the mound covered a rectanguloid pit with which timbers were associated. Burials were absent from the pit, however, and occurred only in the fill and on the base of the mound. They were probably all secondary, although two were partially articulated. There were no clear-cut associations of artifacts with burials, but a number of specimens were recovered from the mound fill and from burrows, of which there were many. The principal artifacts are parts of two small, vertically elongated pots which bear a slight resemblance to some of the pottery from the Sterns Creek component of the Walker Gilmore site on the Missouri River in eastern Nebraska (Strong, 1935, Pl. 19: 1, *a*); several fragments of shell objects like those found in Mound 1 of 39CH4; a few disk and tubular shell beads; two projectile points (Fig. 73: 16, 17); and many perforated canine teeth (Fig. 73: 19). The perforations are cut rather than drilled through the roots of the teeth, and the mesial and lateral surfaces are flattened. The teeth are rather uniformly large and are apparently from either the wolf or a large dog.

The two mound sites do not seem to correspond closely to any known complex, although individual traits are comparable to those in rather widely separated places. The use of small timbers has been noted in the Mille Lacs aspect in Minnesota (Wilford, 1941, p. 237), in the Woodruff ossuary in northern Kansas (M. F. Kivett, personal communi-

[16] Sherds from 25HT1 in the Laboratory of Anthropology, University of Nebraska, have been examined.

cation), and in mounds in North Dakota (Montgomery, 1906, p. 641). The large, washer-like shell objects found in both 39CH4 and 39CH9 occur in the Red River Aspect (Wilford, 1941, p. 246), and in North Dakota mounds (Montgomery, 1906 Pl. XXXVI, H). Finally, perforated canine teeth are among the traits of the Red River Aspect (Wilford, 1941, p. 245), and are in the collections of the Nebraska Historical Society from the Guide Rock, Orleans, and Robb ossuaries in southern Nebraska (M. F. Kivett, personal communication). The Minnesota specimens are wolf, but those from Nebraska vary so greatly in size that several species are probably represented.

This brief and preliminary report on the activities to date of the Missouri River Basin Survey has not provided the final answers to any questions relative to cultural history in the region. We have attempted, by a cursory examination of small samples of a single class of artifacts, to ascertain in a very general way the range of cultures which have existed in the area and to develop some guides to future attacks on those archaeological problems previously outlined by Strong and others and those which are still emerging as the result of additional field research. At least four complexes in addition to those previously reported for the Arikara and at the Arzberger site exist in the rather limited stretch of the river we have surveyed. The four are: at least one Woodland variant, an Upper Republican variant or a complex in which pottery of Upper Republican type is an element, a complex in which pottery of Category B is predominant, and a complex partly characterized by pottery of Category C. There seems little doubt that some of these will prove upon further study to be divisible into two or more cultural units, and extension of survey activities to the as yet relatively untouched parts of the proposed reservoirs will almost certainly add to the complexity of the picture. Completion of the survey at the earliest possible date and immediate launching of an excavation program on the largest possible scale are urgently required. The excavation of such sites as 39ST14 and 39ST15 must be undertaken during the coming field season if they are to be saved from the power shovel and the bulldozer.

River Basin Surveys
Burnett Hall
University of Nebraska
Lincoln, Nebraska

A PRELIMINARY REPORT ON THE THOMAS RIGGS VILLAGE SITE

E. E. MELEEN

THE Thomas Riggs village site is located along the east bank of the Missouri River on the ranch of the late Thomas L. Riggs in the SW¼ NW¼ Section 27, Township 112 North, Range 81 West, Hughes County, South Dakota (Fig. 74). It is approximately 10 miles above the proposed site of the Oahe Dam and will fall well within the limits of the basin of this huge reservoir when it eventually becomes filled.

This particular site, unlike many others in the area, shows little evidence of depredation. This may be due in part to the fact that evidences of occupation are only faintly discernible on the surface. No conspicuous pits or mounds are visible, and the site is covered with a luxuriant growth of native grass which not only conceals the usual telltale surface accumulation of refuse but also obscures the minor surface irregularities. There were, however, noticeable variations in the density and type of vegetation in certain parts of the area which seemed unnatural, and several patches were definitely more verdant than normal. Close examination of these restricted areas led to the discovery of very slight and inconspicuous depressions which, when tested, proved to be pits marking the locations of former lodges.

The general appearance of the site denoted antiquity. Also, the occurrence of rectangular lodges was suggested by the elongated shape of the depressions. Evidences of this type of lodge along the Missouri River had been previously observed to the north in the vicinity of the South Dakota-North Dakota line but were presumably absent in the central part of the state. Because of these rather unusual char-

acteristics, plans for a detailed examination were formulated with the intention of ascertaining the type of lodge and of obtaining, if possible, sufficient material data with which to establish the relationships of the Thomas Riggs occupation to the known Plains cultures.

Investigation of the site was started in November, 1940 as a project sponsored by the University Museum under the Federal Works Program. According to the original plans, the study was to have been completed the following spring, but unforeseen circumstances which developed in 1941 caused all field work in the Pierre area to be suspended for an indefinite period. The project lay dormant until August, 1947, at which time it became possible to resume the work that had been barely started during the earlier period.

To date, only one lodge and one outside cache pit have been excavated. The combination of excessive overburden and the great size of the lodges has greatly retarded progress, particularly as to the number of units that could be investigated with a small party. Details are therefore far from complete. Fully to describe the site at least two more houses

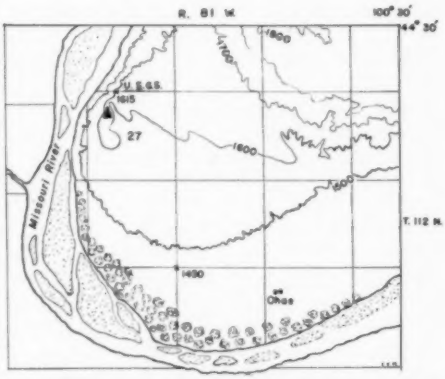


FIG. 74. Map showing the location of the Thomas Riggs village site, South Dakota. The area below the 1500-foot contour line is relatively flat bottom land. Location of the village site is indicated by the triangular symbol.

should be examined. In view of the relatively small amount of work accomplished so far, the primary intent of this paper is merely to present a summary of what has been done and to draw a limited number of rather general conclusions.

DESCRIPTION OF VILLAGE SITE

The Thomas Riggs Village occupies a portion of a flat topped promontory at the very edge of a high, gently westward sloping terrace that borders the valley of the Missouri River. From this vantage point, situated approximately

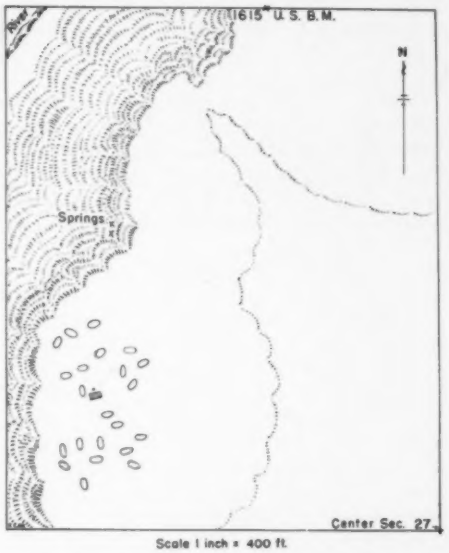


FIG. 75. Map of the Thomas Riggs village site and environs.

160 feet above the river, the inhabitants could view a wide expanse of the surrounding area and particularly that portion of the river valley that extends above and below the village.

Many of the physical requirements necessary to the well-being of a primitive group were present in the immediate vicinity of the site. Although the entire area of the high terrace is devoid of trees, extensive tracts of timber occur nearby on the flood plain below the village. Scattered clumps of trees, consisting mostly of juniper and elm, are also present along the dissected and steeply sloping side hills that border the west edge of the village. Water was obtainable from the river or from springs that still trickle from the base of the gravel beds, outcropping along the face of the more steeply eroded portions of the valley wall. Suitable garden tracts were available on the bottoms, and thickets of wild fruits were probably grow-

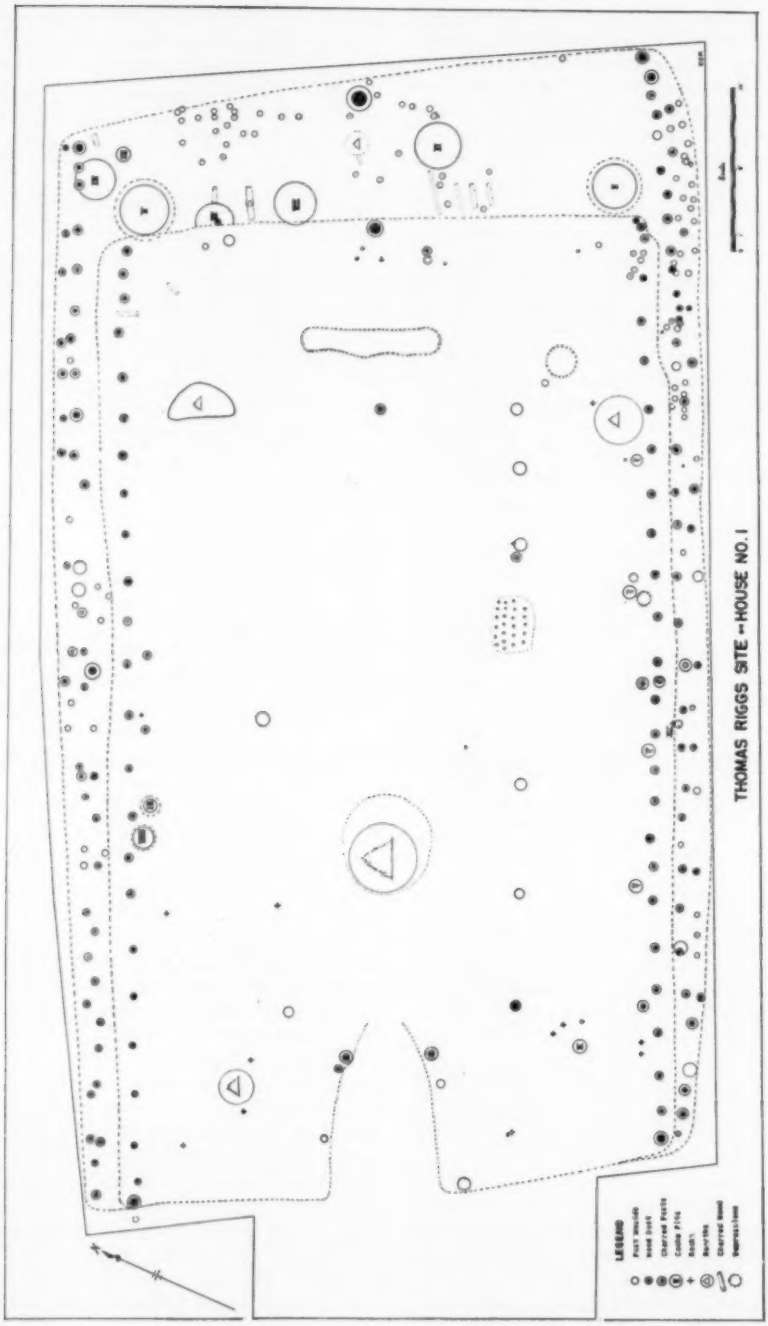


FIG. 76. Map showing the floor plan of the excavated house in the Thomas Riggs site.

ing more profusely then than now on the fertile flood plain.

The village proper covers an area approximately 400 feet wide by 800 feet long with the longer axis paralleling the edge of the terrace. Twenty-three shallow depressions, more or less elliptical in outline, are visible on the surface. These depressions are loosely arranged and quite widely spaced, as shown in Figure 75. Apparently the inhabitants lived peaceably, for there is no surface evidence of fortifications.

DESCRIPTION OF HOUSE I

The lodge chosen for excavation is located in the approximate center of the village, as indicated by the one crosshatched symbol in Figure 75. The depression that outlined the lodge measured 70 feet long east and west by 40 feet wide and had a maximum depth of 0.5 foot at the center.

Below the surface, between 1.5 and 4.0 feet of sterile windblown silt had accumulated since the lodge fell in ruin. The thickness of this silt covering ranged from 1.5 to 3.0 feet near the outer edges to 3.0 to 4.0 near the center. Below this sterile zone and above the floor of the lodge, a second zone was encountered which consisted of mixed soil. The thickness of this zone varied from 1.0 foot near the outer edges to 0.5 foot toward the center. The floor was approximately 4.0 feet below the present surface.

The map of House 1 (Fig. 76) delineates its shape and depicts the larger features encountered during the process of uncovering the floor. The dimensions of the structure, as outlined by the outside row of posts and molds, were 36 by 65 feet. The lodge had been built within a pit dug approximately 1.5 feet below the level of the surface as it existed at that time. Irregular and closely spaced rows of posts had been set along the edge of the depressed floor on both the north and south sides to form the two longer walls of the lodge. These posts measured 0.5 to 0.8 foot in diameter and extended below the floor to a depth of 1.5 to 2.0 feet. Practically all of the posts along the outer wall were charred and in many instances sections were still standing in their original upright position (Fig. 77). A number of the better preserved specimens were saved for the purpose of dating.

In marked contrast to the number of posts occurring along the two longer sides, very few clearly defined posts or molds were found at the two ends. Along the east wall one large timber, a foot in diameter, had been set midway between the ends of the two longer walls, where it evidently served as a support to both the wall and roof. Similar conditions existed along the west wall, where one post mold appeared on the south side of the ramp leading into the lodge.

If posts had been used inside the lodge to support the roof, their presence had been obliterated by a later period of construction which is represented by a slightly smaller and more deeply excavated area, the outline of which is indicated by the second dotted line within the larger area in Figure 76. The floor of this second and presumably later structure measured 58 by 38 feet and had been dug to a depth of 1.5 to 2.0 feet below the level of the first occupation. The removal of the fill from the two levels within the excavation left a narrow but well-defined ledge or shelf 1.5 to 2 feet wide along the two longer sides, and an area resembling a platform on the east end. On the west side, the wall of the second excavation had been dug down in line with the original wall. This was probably done to make use of the entrance ramp that remained from the first construction. The walls of this smaller lodge were constructed in much the same manner as the first. The posts were approximately 2.5 feet from the outer row of posts and were quite evenly spaced along the edge of the depression. They were, however, slightly smaller than those of the outer row, averaging about 0.5 foot in diameter. Many of the posts of the inner wall, like those of the first occupation, were charred and standing upright from the floor (Fig. 77). The remains of coarse charred grass were commonly found intermixed with charred wood and soil between the two rows of posts.

On the floor of the second level, molds were found toward the interior, evidently in the position of posts that supported the roof. Two rows of these molds, quite widely spaced and more or less in alignment, extended across the length of the floor, approximately one-third the distance in from the walls. Unlike conditions found along the outer walls, little remained of the posts in these molds; for the most part only traces of wood dust were found.

In addition to the timbers used in the construction of the main portion of the lodge, a few were found which evidently had been used to enclose the entryway and possibly to support a part of its roof. These posts were located along the edge of the ramp leading down into the lodge. The presence of wattle at their bases and

along the edge of the ramp indicates the possible use of this type of material as a wall covering for the entryway. The fact that wattle was not commonly found along the walls would suggest, however, a rather limited use of this material in the construction of the lodge.

The entrance to the lodge faced west southwest. This feature was marked by a sloping earthen ramp that started a short distance beyond the outside edge of the west wall and extended into the interior, a distance of 11 feet, before reaching the lower floor level. The width of the ramp tapered from 6 feet at the outer end to 3 feet at the floor. The sides had been cut almost vertically down to the level of the interior of the lodge. The surface of this ramp was hard-packed and smooth.

FIG. 77. A portion of the south wall of House 1 at the Thomas Riggs site, showing the two floor levels and the charred posts and molds on each.

Major features uncovered while excavating House 1 include a large circular firepit, several smaller hearths, eleven cache pits of varying shapes and sizes, and a number of shallow depressions of somewhat questionable purpose. In addition, rocks were commonly encountered on the floor in various parts of the lodge. Some occurred singly, others in groups of 2 to 24 in number. For the most part they represented unworked cobbles that had been carried in apparently for a specific purpose, possibly to be heated and used in cooking foods. The large number of fire-cracked rocks found in the refuse-filled pit on the exterior at least suggested some such use.

The platform that remained at the east end of the excavation appears to be a vestige of the earlier construction. This space varied in width from 7 feet at the north end to 10 feet at the south end. The west edge of the area was marked by an abrupt and vertical drop of 1 to 2 feet to the lower floor level. Extended on the surface of the hard-packed floor of this platform were found the impressions of several charred posts, probably representing the remains of fallen ceiling beams. One small hearth was also encountered in the approximate center of the area. The ash from this feature consisted largely of fragments of calcined bone.

It was also on this upper floor level that all of the larger cache pits were encountered. Two types were present, straight sided and bell-shaped. Pits I and V in Figure 76 are representative of the latter type. The diameter of Pit I at the orifice was 2.5 feet expanding to a maximum of 3.6 feet at the bottom. The bottom was flat and extended below the level of the floor to a depth of 3.5 feet. Pit V was very similar to Pit I except that the orifice measured 3.0 feet in diameter and the base was slightly rounded. Pits II, III, IV, VI, and VII were straight-sided and ranged from 0.8 foot to 4.5 feet in diameter and from 1.6 to 3.0 feet in depth. From all appearances, Pits IV and VI were features that had existed prior to the construction of the lodge. Both were comparatively shallow and showed signs of having been disturbed during the time the original house pit had been dug. This same condition may apply to Pit VII though the disturbance is not so marked. None of these pits contained much in the way of artifacts. Two scapula hoes were recovered, one each in Pits IV and V. Pit I contained the skeleton of an adult female in a tightly flexed position. With the exception of a few sherds and a flint chip in the mixed soil below the skeletal material, this pit was sterile. Pit V contained a single human fibula and the remains of the skeleton of a raven 2 feet below the floor.

Three smaller cache pits were found on the second or lower floor level and one along the ledge a few feet west of the center of the south wall. Pit VIII contained a supply of unworked flint while Pit XI had been filled with refuse consisting of ash and bone fragments. One bone awl was recovered from this debris. Pit

X in the southwest corner of the lodge was sterile. Pit XI, on the ledge representing the level of the first floor, contained mixed soil in which a bone tube shaped from the wing bone of a bird and one small bone fishhook were found.

The large firepit and the smaller hearths, with the exception of the one hearth found at the east end of the excavation, were all on the lower floor level. The large unlined firepit was located in the approximate center of the west half of the smaller lodge. Its diameter was 3.1 feet and its depth at the center, 1.5 feet. The floor of this basin-like depression was baked to a brick-red color. The lodge floor adjacent to the east side of the pit showed a similar baked condition, as outlined by the dotted line in Figure 76. This was undoubtedly due to drafts from the entryway blowing heat across the floor. A lense of white compacted ash filled the pit to within a few inches of the floor level.

The hearths had been built on the level surface of the floor. The position of these features was marked by an accumulation of ash, calcined bone fragments, rock chips, pieces of pottery, and charcoal above the floor, and by fire-reddened soil beneath the surface. Three such areas were present on the lower floor level, as shown in Figure 76.

The purpose of the elongated depression near the east end on the lower level is questionable; possibly it may have had some ceremonial significance. The feature was of unusual shape being approximately 9 feet long by 1.6 feet wide. The base of the depression extended below the floor to a depth of 0.65 foot. The sides of the shallow pit were vertical and the bottom flat. The ends were rounded. Except for a noticeable outward bulge at the center of the inner side, the two longer sides were parallel. The material within the depression consisted of a blackened soil devoid of artifacts. Other smaller basin-shaped depressions appeared on the floor near the south wall. Fragments of pottery were recovered in some. From the general shape of these features, it may be deduced that the inhabitants hollowed out the depressions to hold their pots in an upright position.

DESCRIPTIONS OF ARTIFACTS

Considering the size of the excavation, the exploration of House 1 yielded an unusually meager quantity of artifacts. The variety of forms recovered are sufficiently diverse, however, to develop a tentative trait list, which can be expanded as more data become available.

The material recovered consists largely of artifacts manufactured from stone, bone, and clay. Articles of shell, though well preserved when found, are very rare. Unfortunately the pottery industry is represented by a comparatively small number of pieces. No whole pots were found and only a small collection of 85 rim and about 400 body sherds is available for comparative study.

Artifacts of stone. There are a variety of rough, pecked, ground, and flaked artifacts. The larger forms include such implements as metates, grooved and ungrooved mauls, a pecked and partially polished diorite celt, several water-worn pebbles that have been used as pecking stones, and a few irregularly-shaped fragments of scoria that have been used as abraders.

Chipped stone artifacts include one small unnotched triangular point with serrated edges, two large leaf-shaped projectile points similar to Strong's Nab2 type, several end scrapers of medium size, a number of side scrapers of flint with only one edge retouched, and a few larger leaf-shaped knives made from quartzite or less commonly from flint. A light, honey-colored chalcedony and the brown Knife River flint appear to be the most common types of stone used in the manufacture of the finer chipped implements, while green quartzite has been used almost exclusively in making the larger knives and scrapers. Workmanship displayed in the manufacture of these implements is fair to mediocre.

Artifacts of bone. The bone implements, although not numerous, are usually well preserved, and show better than average workmanship. Of the larger bone tools, the scapula hoe with the inferior articulate unmodified, and gouges made from bison metapodials, are the most common forms. One of the gouges appears to have been hafted and used as a crude hoe or pick (Fig. 78, B, *a*). The others seem to be similar to those commonly used as fleshers, although none are notched. Several smaller and narrower implements of bone display one chisel-shaped end. These are commonly made from a thick section of bone, usually the metapodial. They, too, were possibly used as fleshers (Fig. 78, B, *b*, *e*).

Awls are the most numerous of the bone tools. Three types are present: those made from sections of bird metatarsals, those shaped from

random sections of the heavier mammal bones, and the more abundant forms manufactured from longitudinally split sections of deer or antelope metapodials (Fig. 78, A, *a–i*). A great deal more care has been taken in shaping and finishing this last type of awl; the rough split edges have been smoothed and the articulate end, which ordinarily receives little attention, has been given special treatment on most of the specimens. Both sides of the joint have been ground down to such an extent that the worked surface merges smoothly into the articular ridge which forms the butt of the awl. Of the six awls of this type recovered, five show this rather uncommon treatment.

FIG. 78. Artifacts from the Thomas Riggs site. A: *a–i*, awls; *j*, bone tube; *k*, fishhook; *l*, incompleted awl; *m–o*, shell beads; *p*, portion of a clay pipe; *q*, antler chipping tool; *r*, shell disk. B: *a*, *c*, heavy bone gouges; *b*, *d*, chisel-shaped fleshers; *e*, scapula hoe.

The remaining bone artifacts are as follows: two flaking tools, a single bone tube cut from a bird bone, and a fishhook. One of the flaking tools has been shaped from a thick section of a metapodial while the second has been made from the tine of an antler (Fig. 78, A, *q*). The bone tube, which is smoothly finished at both ends, measures 2.5 inches in length and is slightly larger than the diameter of a pencil (Fig. 78, A, *j*). The fishhook is small with a straight shank, along which grooves have been cut to facilitate attachment (Fig. 78, A, *k*).

Artifacts of shell. Artifacts of shell consist of one unperforated disk, 44 mm. in diameter, which had been cut from a Unio shell; two smaller perforated disk beads also made from Unio shells; and one small pierced cylindrical shell bead of marine origin (*Oliva* sp.?). See Figure 78, A, *m–o*, *r*.

Pipes. Pipes are represented only by fragmental pieces composed of pottery clay. One disk-shaped fragment, apparently the top portion of a bowl, was the most complete specimen (Fig. 78, A, *p*). Several smaller fragments appear to have been pieces from a flat type of pipe.

Metals. No metals or other trade goods were found which would indicate contact with whites.

DESCRIPTION OF POTTERY[1]

Pottery from the Thomas Riggs site, as before mentioned, is represented by 85 rim and 400 body sherds, all found during the course of the house excavation. The characteristics of the paste and color do not appear to vary significantly in the entire series, with the exception that there is a tendency for the larger vessels to show a higher proportion of tempering particles. Granite crushed to a medium-sized grit and mixed with the clay in liberal quantities was the only tempering material observed. The resulting texture ranges from medium fine to medium coarse. The paste tends to crumble rather than flake. Dark gray to black shades predominate on the interior, exterior, and core of the sherds, but occasional specimens also display a buff to brown exterior color. Twelve per cent of the sherds show additional smoke blackening on the exterior surface. Most vary

[1] The writer is deeply indebted to Dr. Albert C. Spaulding for the organization of the data on the ceramic industry. The description has been developed as a joint endeavor and has evolved from basic data submitted for review to the Museum of Anthropology, Michigan University, Ann Arbor, Michigan.

from 3 to 4 in hardness with extremes of 2.5 and 5.

The surface finish on the body sherds is predominately smooth. Only a small number (7%) bear the impression of a grooved paddle. None has been treated with a cord-wrapped paddle.

Analysis of the limited number of rim sherds suggests a division into four types of vessels, based primarily on rim shape. It is suspected that a significant association of decorative and other features with these rim types would be apparent in a larger series of sherds. The types are: (1) a variety on which the rim is straight and either vertical or outsloping; (2) a type having a flaring, usually low rim; (3) a higher, outwardly convex rim which blends smoothly into a concave neck to give an S-shaped profile; and (4) a collared type with either straight or outwardly convex rim, bordered on its lower margin by finger punctates or other special treatment. The distinguishing feature of the collared type (4) is an actual thickening and ornamentation of the lower rim border rather than a difference in basic rim shape, and the type appears to be closely related to (1) or possibly (3).

About 80 per cent of the rim sherds are of the straight type. Both vertical and outsloping forms are common, with the latter predominating. These sherds appear to be derived from fairly large vessels with globular bodies (Figs. 79: 1–4; 80, *l*, *p*, *r*). Estimates of orifice diameter range from 18 to 36 cm., and of rim heights, from 25 to 50 mm. Measurements of rim and body thickness range from 4.5 to 9 mm. for the former and 3.5 to 5 mm. for the latter. One unusually complete sherd (Figs. 79: 2; 80, *p*). had the following dimensions: rim height 25 mm., rim thickness 4.5 mm., orifice diameter 18 cm., diameter at base of rim 15 cm., shoulder diameter 22 cm., body thickness 3.5 mm., and an estimated total height of 150 mm. The lip forms on this first type are either rounded or flat. The juncture of rim and upper body is marked by a well defined angle, and the shoulder area tends to be flattened and to approach the horizontal rather than to form a smooth spherical curve. Although direct evidence is lacking, body sherds suggest a smoothly rounded base for all vessel forms at the site. A few lips of the straight rimmed type show pointed projections (Fig. 80, *r*), but the number and arrangement of such features on the vessels is not known. Surface finish on identifiable sherds is invariably smooth, and sometimes shows enough burnishing to reflect medium strong highlights. Decoration occurs only on the surface of the lip and takes the form of diagonally incised or impressed lines or notches, or less commonly a series of closely spaced punctates on the flat lip surface or vertically incised lines on the outer margin of the lip. The lip of one rim sherd bore a single incised, zigzag line. Most of the lips have been decorated with one or the other of these designs.

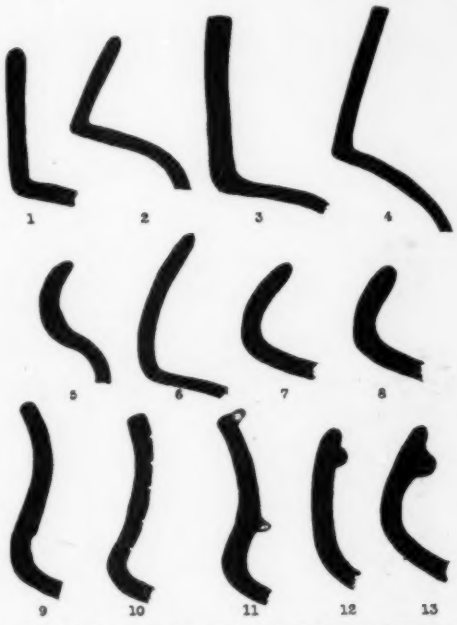


FIG. 79. Cross section of rim sherds from the Thomas Riggs site (outside surface to the right). 1–4, straight rim types. 5–8, flared rim types. 9–11, S-shaped rim types. 12, 13, collared rims. Full size.

The second type, characterized by a flaring rim, constitutes only 8 per cent of the rim sherds. This limited sample does not permit more than a speculative description of total shapes, but a rather small vessel having a low, outcurving rim appears to be characteristic (Figs. 79: 5; 80, *d*). Estimates of vessel size on the basis of rim sherd measurements are: rim height 20 mm., rim thickness 8 mm., orifice diameter 20 cm., and diameter at the base of the rim 16 cm. The juncture of the rim and body in this type assumes a smoothly rounded shape.

The shoulder area also appears more rounded. The lip form is commonly rounded or beveled. Again, all available evidence suggests a smooth surface finish. Broad notches on the margin of the lip are common. One sherd (Fig. 80, *c*) has a pointed lip projection. This sherd is also one of a few showing decoration on the shoulder area: a chevron motif extending from the outer

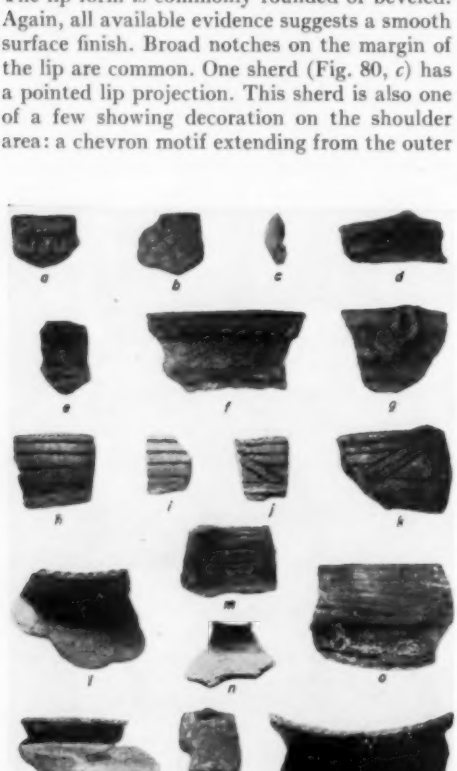


FIG. 80. Rim sherds from the Thomas Riggs site. *a–k, m, o, q*, decoration beneath the rim: *a, e–g*, collared type; *b*, straight rim type; *d*, flared type; *h–k, m, o, q*, S-shaped type. *l, n, p, r*, decoration limited to the rim: *l, p, r*, the more common straight rim type; *n*, the flaring rim type.

margin of the shoulder nearly to the rim base. This particular design consists of shallow trailed lines 2.0 to 3.0 mm. in width. In all, twelve sherds, probably from six vessels, have the shoulder area decorated with either medium-wide trailed lines or narrow incised lines, and on most the decoration assumes the form of chevrons. The designs composed of narrow incised lines are more closely spaced but not so neatly applied as those formed by the broader and shallower lines. In general, the latter are composed of more definitely separated sub-units. It is not certain that the incised shoulder area is confined to vessels having flared rims, but this was invariably the case where rim and decoration occurred on the same sherd.

The third type, having a flattened S-shaped rim and neck profile, is represented by 12 rim sherds, or about 14 per cent of the total. These rims are thought to have been associated with larger vessels having globular bodies (Figs. 79: 9–11; 80, *h–k, m, o, q*). Sherd measurements yield the following estimated dimensions: diameter of orifice 22 to 28 cm., rim height 33 to 47 mm. Lips are characteristically narrow and rounded. Nodes projecting outwardly from the lip or lip margin (Fig. 80, *k, m, o*) constitute the major decorative element. The rim and neck area has a smooth surface finish, but the treatment of the body is unknown. Cord-impressed or incised decoration appears on the collars of all rims, five sherds being cord-impressed and the remainder incised. The design consists of three, four, or five fairly evenly spaced encircling horizontal lines. Three of the cord-impressed sherds show that these lines were interrupted by upward pointed nested chevrons (Fig. 80, *h, j, k*), and in two cases a pointed lip projection occurs immediately above the point of the uppermost chevron. One of the incised sherds shows an interruption of the horizontal lines directly below a small tab or lug, which extends laterally from the lip (Fig. 80, *m*). Cords used in decoration were 2 mm. in diameter and the individual impressions were spaced from 5 to as high as 10 mm. apart. Lines forming the chevrons were more closely spaced, generally from 3 to 5 mm. apart. The incised lines follow much the same pattern, with the space between impressions 5 to 7 mm. A less common type of decoration is represented on one sherd (Figs. 79: 11; 80, *q*). The specimen is undecorated except for a small tab which extends laterally from the margin of the lip and a node projecting from the lower rim border.

The final class, that of collared rims, is, as was noted above, distinguished by the thickening and ornamentation of the lower rim border. In profile, the rim may be straight or S-shaped (Figs. 79: 12, 13; 80, *a, e–g*); vessel form, dimensions, and surface finish are probably similar to the ones in those two classes. Dimensions of measureable rims are as follows: rim height 33 to 47 mm., diameter of orifice 22 to 36 cm. Surface finish on identifiable sherds

is characteristically smooth. Decoration of the collared type has been observed on the rim only and is exclusively incised or modeled. On one sherd the modeling takes the form of a node with central punctation placed on the rim and extending from slightly above the lip to the lower border (Fig. 80, *g*). Lips are rounded or flat and invariably plain. The collared type shows a number of features of decoration and general form which are also found in the S-shaped rim class and the two may be related. Separation of the types is probably useful for historical reasons, however. Future work may show that the straight-rimmed, collared form is ancestral to the S-shaped form.

SUBSISTENCE AND FOOD GATHERING

Little evidence was found in the portions of the site so far examined to indicate that plant foods were extensively used by the inhabitants. Vegetal remains are represented solely by a few charred pits of wild fruit. The common occurrence of the scapula hoe suggests, however, that these people practiced some form of horticulture to supplement the foodstuffs that grew wild. It is suspected that direct evidence of cultivated crops will eventually be found.

Animal remains were of mammals, birds, fish, and fresh water clams. The first were most numerous. Of the larger types, the remains of the bison and deer were the most plentiful. The smaller mammals were represented by both herbiverous and carniverous species. Several species of birds, particularly waterfowl, had also served as an important item of food. Fish and clam, on the other hand, appear to have been used in limited numbers, possibly because of the difficulty in getting them.

SUMMARY AND CONCLUSIONS

Prior to the present investigation very little intensive work had been done on comparable sites in South Dakota. The only published data which appear to be of the same general type are found in a report by Strong (1940, p. 378) on field work done in 1932 at the Rygh site in Campbell County, approximately 30 miles downstream from the North Dakota-South Dakota line. Strong dug a 10-foot square, 7 feet deep, through one of the large refuse middens, using 1-foot levels in an effort to determine the cultural changes during the period of occupation of the site. He gives a rather brief but interesting description of the results.

Strong (*op. cit.*, p. 379) concludes that the Rygh site is of Mandan origin and protohistoric age. The Mandan identification is based upon the close relationship existing between the traits found in the Rygh site and those of the better documented Double Ditch and Old Fort Abraham Lincoln sites in North Dakota. The age was determined largely by the presence of fragments of metal in the upper 3 feet of the trench.

Unfortunately, information concerning the house types at the Rygh site is very limited. Strong (*op. cit.*, p. 379) mentions that the surface appearances are very similar to those at the two above-mentioned sites in North Dakota. According to Will and Hecker (1944, p. 18), the Mandan traditions indicate that the first villages occupied by these people consisted of rectangular or square houses laid out in rows. These conditions are at least in part present at the Thomas Riggs site: rectangular lodges appear to be common but the arrangement of lodges in rows is not apparent.

In general, it may be said that the houses of the earlier Mandan villages in North Dakota conform in size and shape to conditions observed at the Thomas Riggs site. This relationship is particularly marked at the Huff site, where one lodge was completely uncovered and two others partially worked (Will and Hecker, 1944, p. 19). All were rectangular in shape and semi-subterranean. Side walls were built up of closely spaced posts 6 to 8 inches in diameter and the end walls were supported by large posts located in the center of the span at each end in much the same manner as at the Thomas Riggs site. Features found within the lodges which are common to both sites include cache pits, both large and small; a large firepit located near the entrance; and small, shallow basin-shaped depressions on the floor in which, at the Huff site, pots were actually found.

The two sites differ in some respects. For one thing, the houses in the Huff site were arranged in rows. Also, the Huff site was fortified, a well-defined ditch encircling the village on three sides. Inasmuch as the Huff site is considered to be Middle Mandan by Will and Hecker (1944, p. 60), these variations may be due to a difference in time rather than culture.

Passing downstream again to the Rygh site, it is of interest to note that this site had also been fortified. A ditch or moat is plainly discernible on the north and west sides but it is

not too well defined on the east and south.

Comparison of the cultural traits represented by the various types of artifacts recovered from the Rygh and Thomas Riggs sites, offers further evidence of a rather close relationship between these two sites. This is particularly true of the material recovered from the lower levels in the Rygh village. Strong (1940, p. 378) found that incised decoration of pottery decreased from bottom to top, whereas cord decoration increased. Simple straight rims, often with parallel, horizontal incised decorations, were characteristic of the lowest levels. In the third level from the bottom an elaboration and multiplication of all types began to develop. The characteristic rainbow decoration, the rare fabric marking, and equally rare cord-wrapped stick decoration appeared at this level. Strong also noted that closely spaced cord decoration was highly conventionalized and more or less static from top to bottom, whereas incised designs became more intricate. Strangely, no collared or S-shaped rims were encountered in the lowest levels of the excavation at the Rygh site. The S-shaped rim appeared rather suddenly in the third level, however, and from there on persisted to the top. In so far as comparisons can be made, the absence of these two types of vessel shape is the most noticeable difference in pottery between the two sites; it is, however, entirely possible that the two were present at the Rygh site but were not encountered in the limited area of the excavation. Though a detailed description of the pottery from the Rygh site has not yet been published, it is quite evident that the pottery from the earlier levels at that site is essentially of the same type as that found in the Thomas Riggs village, and that none of the elaborate forms common to the later periods are present at Thomas Riggs.

The traits represented by the bone and antler work in the two South Dakota sites are widespread throughout the Plains area and therefore not particularly diagnostic. The most common forms include bone gouges, scapula hoes, fleshers, bone awls, and flaking tools. Types present only in the Rygh site are those which Strong (1940, p. 378) describes as bison scapula "hide wringers," cancellous bone skin dressing implements, socketed projectile points, bird bone whistles, and goose head ceremonial objects. The last mentioned types were taken from Levels 3, 4, and 5 and apparently represent forms that developed relatively late in the stratigraphic sequence. It is significant that many of these later types mentioned by Strong are forms that also appeared in the Oahe site, which is of Arikara origin and considered to be protohistoric in age. Apparently contacts had been made between the two groups during the period represented by the upper levels at the Rygh site, from which a noticeable blending of traits developed.

The stone artifacts from the Rygh site are barely mentioned by Strong (1940), and consequently the relationships of these materials remain obscure. Will and Hecker (1944, p. 25), however, report that pecking stones, grooved mauls, stone hammers, and polished celts are commonly found in the Mandan sites of North Dakota. Abraders of sandstone and scoria also occur in all sites. Grooved axes are rare. Flint arrowheads, plentiful in the earlier sites, are replaced by those of metal in later villages. The flint points are small triangular forms, generally notched. Of the stone implements, the projectiles in particular are so poorly represented at the Thomas Riggs site that detailed comparisons must await future determination.

Information relative to the ceremonial practices of the Thomas Riggs inhabitants is also very limited. Aside from the skeletal material encountered in the two cache pits and the occurrence of fragments of clay pipes, little is known. The burial grounds, if they do exist, were not located. Nevertheless, certain similarities can be noted with the burial habits at the North Dakota sites. Strong (1940, p. 362) reports encountering a bundle burial and one flexed burial, as well as scattered human bones, in limited excavations at the Double Ditch site. At the Old Fort Abraham Lincoln site there were eleven burials in pits covered with slabs of wood and several in the deepest and oldest cache pits. Grave goods were rarely found with the skeletal material.

Some of the burial customs reported for the North Dakota sites have also been found in certain Arikara sites of South Dakota. The practice of burying the dead in shallow pits in a flexed position and the use of slabs of wood or bark to cover the grave are commonly found in Arikara sites. The burials in deep pits, and especially those in cache pits within the lodges, appear more common to Mandan sites. Secondary burials are also of more common occurrence in Mandan sites. Strong (1940, p. 362) is in-

clined to attribute the burials in cache pits within the lodges to emergency conditions, but the practice seems to be widespread.

On the basis of data obtained at the Swan Creek site in Walworth County, South Dakota, it is suspected that the Mandans also buried in plots on the outskirts of their villages. The skeletal remains were here encountered in pits approximately 4 feet in diameter at depths of 5.5 to 6 feet below the surface. Primary burials were invariably flexed, and in all but one instance the pits contained single individuals. Two skeletons were found in one pit, which also contained the only grave goods found in this series, two catlinite pipes and several projectiles showing unusual workmanship, which had been placed approximately 1 foot above the bodies. Only one secondary burial was excavated; a single pit contained the disarticulated remains of five individuals.

The large number of charred posts in the Thomas Riggs site presented a splendid opportunity to obtain material for tree ring studies. Sections from the timbers were submitted to Mr. George Will of Bismark, North Dakota for determination of dates. The climatological conditions of central and northern South Dakota should compare most favorably with those represented in the master chart established for North Dakota. It is believed that correlations, though as yet unconfirmed, should prove reasonably close. However, pending the integration of data from intermediate points these dates must be used with discretion; they are presented here on a tentative basis.

Dates ranging from 1477 to 1516 A.D. were obtained from a series of six specimens. Because some of the timbers had considerable wood on the outside which could not be read with any degree of certainty, several of these dates are possibly short of actual cutting dates by five to ten years. However, by using the average of the six specimens and allowing ten years for the possible shortage on the outside, it appears reasonable to assume that the Thomas Riggs site was established about 1480 A.D.

If this date proves correct, it points to a considerably later period for Mandan occupation in South Dakota than has previously been proposed. Since the Thomas Riggs site probably represents an early manifestation of Mandan culture, the date also establishes a relatively short period of development for both the Archaic and Middle Mandan periods in North Dakota. Will and Hecker (1944, p. 66) give 1650 as a tentative date for the beginning of Late Heart River, which is their latest period, or the point at which Mandan ceramics reached its highest development prior to White influences. If they are correct, and assuming that the occupation of the Thomas Riggs site was contemporaneous with the Archaic Mandan manifestations in North Dakota, their two earlier periods cover a span of only about 170 years.

The dates furnished by Mr. Will for the Thomas Riggs site assist materially in the interpretations of some of the questionable problems encountered in House 1. The two extremes in age represented by the timbers confirm a suspicion that the occurrence of two floor levels represents two rather than one period of construction. The dates of the older group of posts range between 1477 and 1490 A.D. while those of the second period fall between 1502 and 1515. The first lodge was undoubtedly destroyed by fire. The second was probably built soon afterwards, within the ruins of the first, by excavating to a depth of 1.5 to 2.0 feet below the level of the original floor. The method of construction in both appears almost identical. Destruction of the second lodge, as in the case of the first, appears to have been by fire.

The foregoing data have been presented primarily to assist those involved in the detailed study of innumerable sites soon to be flooded along the course of the Missouri River. It is hoped that the information may serve in part as a guide to future work in this area. So far only the barest of facts are known. Before complete documentation of the Thomas Riggs Village and similar sites can be attained much additional work in the field is obviously needed. For that reason no detailed classification has been attempted. Present data, however, indicate the existence of a close relationship to manifestations which have been considered of Mandan origin, and particularly to that representing the earliest period of Mandan occupation.

University Museum
University of South Dakota
Vermillion, South Dakota

BURIAL MOUNDS IN THE BALDHILL AREA, NORTH DAKOTA

GORDON W. HEWES

TWO burial mounds on the east bluff overlooking the left bank of the Sheyenne River, east-central North Dakota, were excavated between June 25 and August 1, 1948, by a field party of the University of North Dakota, working in coöperation with the North Dakota State Historical Society.[1] The archaeological resources of the area of the Baldhill Reservoir had been appraised in 1947 by a party of four, headed by M. F. Kivett, for the Missouri Valley Project of the River Basin Surveys. This survey resulted in the mapping of ten sites, three of them mounds or mound-groups, and the partial excavation of one mound to salvage skeletal material already partly exposed.

Construction of Baldhill Dam, about 9 miles north of Valley City, was already far advanced in 1948, and several occupational sites in the Sheyenne River bottomland were in danger of flooding within a few years (see Fig. 81, *a* and *b*). Unfortunately, neither surface collections nor significant excavations of the bottomland occupational sites were possible during the season allotted to the field session, owing to the presence of valuable wheat crops. Heavy spring floods had delayed planting in the bottomlands, so that these crops had not been harvested at the time of our departure. On Site 32-BA-6 (T 142 N, R 58 W, SE¼ Sec. 16) and Site 32-BA-8 (Rasmussen site, T 140 N, R 58 W, SE¼ Sec. 29), limited test-pitting yielded little or nothing of archaeological significance, though sherds, animal bone, chipped stone, and river-mussel shell occurred on the surfaces of both. The latter site, however, is well represented in the surface collections of Mr. Vernon Gale of Valley City. Excavation of the bottomland sites at a more favorable time of year, and on a larger scale, might result in more positive evidence.

Site 32-BA-1 (T 142 N, R 58 W, NW¼ Sec. 10 and E½ Sec. 9, Barnes County), consists of two or more mound-groups, separated by about one-half mile. It is on the property of Mr. E. Duff of Dazey, N. D. The two most prominent mounds, A and B, 400 and 200 feet respectively from the edge of the bluff and about 270 feet apart, are about one mile south of the confluence of Baldhill Creek and the Sheyenne River, lying in a very gently rolling plain, here cut to a depth of 60 to 70 feet by the river valley. In this portion of its course the Sheyenne flows generally southward, though bending locally to the south southwest. The great bend of the Sheyenne, where it turns eastward toward the Red River, north of Fargo, is 60 miles south southeast.

The river bottomland is timbered, chiefly with elm, ash, and oak, where it is not under cultivation. The native vegetation of the plain was probably tall-grass prairie, but the recent use of the area around the site for cattle pasture has emphasized the non-grass elements—low shrubs and even a small cactus.

The soil of the plain around the mounds is a thin brown topsoil 7–11 inches thick, with a feebly developed humus layer, underlain by a yellow-brown clayey soil extending to 14–20 inches; this gives way quite sharply to a bed of small to coarse pebbles (some up to 12 inches long), mixed with sand, white, yellowish, or

[1] Personnel included Lucile Hoyme, Loren Johnson, Arthur Parker, Mary P. O'Donnell, Luella Watkins, and the writer. The Valley City State Teacher's College kindly provided a laboratory room and other facilities. Mr. Vernon Gale of Valley City, a local collector, was also very helpful.

EXPLANATION OF FIG. 81. A. Map of North Dakota and adjacent areas; VC is Valley City. B. Sheyenne River north of Valley City, with site locations; black triangles mark occupational sites, others are mounds. C. Vertical section of Mound B, Site, 32-BA-1: *a*, mound fill; *b*, "backdirt" from aboriginal excavation of central burial pit; *c*, original topsoil surface; *d*, yellow-brown clayey soil; *e*, gravel and pebble layer; *f*, fine yellowish sand; *g*, human skeletal remains. D. Enlarged vertical section of central feature of Mound B: *a*, grass roots at mound surface; *b*, pockets of sand and gravel in mound fill; *c*, "backdirt"; *d*, boulders forming sill of central pit; *e*, *e'*, oak beams and fragments; *f*, fine layer of carbonized grass-stems, ash; *h*, original topsoil; *i*, yellow-brown clayey soil; *j*, gravel and pebble layer; *k*, fine yellowish sand; *l*, human skeletal remains. E. Horizontal plan of central feature of Mound B: *a*, oak beams; *b*, bison vertebrae in articulations; *c* sill of boulders; *d*, boulders within central pit, at various depths; *e*, *f*, beads; *g*, rib tool; *h*, outer limit of central burial pit.

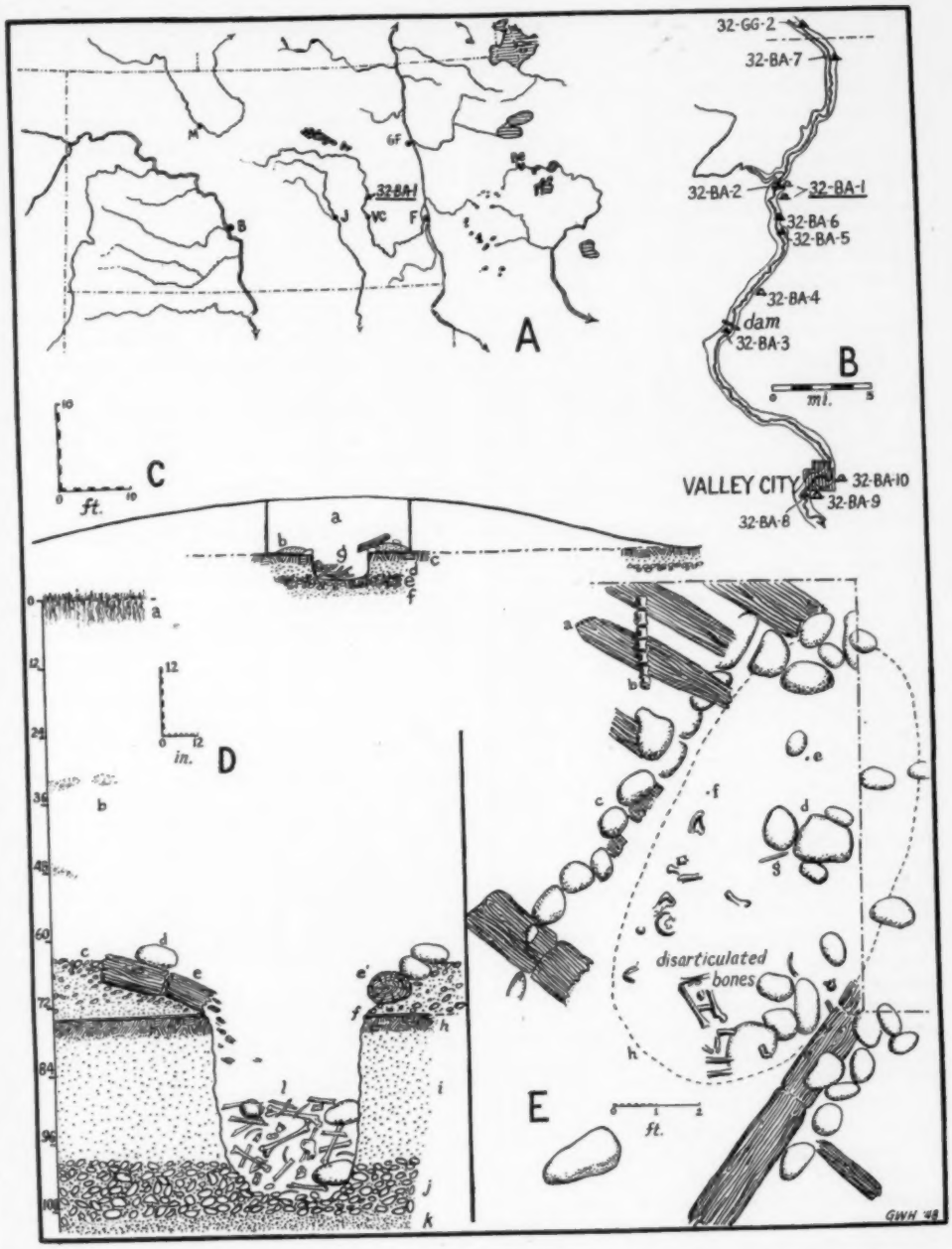


FIG. 81. Map, plan, and cross section of Site 32-BA-1, North Dakota. (See facing page for explanation.)

stained to a reddish-brown. A fine yellowish sand underlies the pebbles at depths varying from 36 to 48 inches from the surface. The central burial pit features of both mounds extended through the pebble-layer to the sand.

No borrow-pits from which material for the mounds might have been taken were discernible, though slight depressions within a few hundred feet might have been former sources for fill. Excavation in the mounds showed that they had been built of topsoil almost entirely. The original topsoil surface could be traced to the edges of the central burial pit features in both mounds (Fig. 81, *c*, *d*), no preliminary "cleaning away" of the topsoil prior to building the mounds was indicated. In Mound B, the original topsoil surface was marked by a fine layer of fine carbonized grass-stems and ash, suggesting a deliberate burning-off of the vegetation prior to the raising of the mound. It is perhaps worth noting that the thickness of the brown topsoil covered by the mounds was neither greater nor smaller than the thickness of the topsoil beyond the mounds; erosion of the soil unprotected by the mound masses has been no greater in recent decades than of the soil preserved under the mounds. Numerous large granitic boulders, of glacial origin, lie scattered about in the pasture-land around the mounds, and many were incorporated in the mound fill. Some boulders were exposed on the mound surfaces, but they do not seem to have been placed in any intentional pattern, and may represent stones used for fill which have been uncovered by erosion of the mounds.

Both mounds were approximately circular, 100 feet in diameter, and sloping gradually to a roughly truncate conical shape. Both were steeper on their northwestern sides, doubtless because of the prevailing winds from that quarter and their position relative to the edge of the river-valley bluff. Depending upon the plain surface chosen as a base, the heights of the two mounds were 6 or 7 feet. At 50 feet northwest of a stake on the summit of Mound A, the height was 79 inches; 50 feet northwest of a similar stake on Mound B, 83 inches.

In view of the short distance between the mounds (270 feet), it seemed advisable to excavate them simultaneously; if rich finds (in terms of artifacts) were to be made in one mound alone, the presence of an adjacent unexcavated mound would almost certainly attract casual "pot-hunters." The small size of our crew determined the excavation procedure: 10 by 10 foot pits were started from the summits of both mounds, on the assumption that the principal features would lie near the center. Complete excavation, or even complete cross sectioning would have been desirable but impossible within the time limits, or without the use of power-driven earth-moving implements. Ultimately, as the lay-out of the central burial features in each mound became evident, 5 by 10 foot additions were made to the two 10 by 10 foot pits.

No significant stratigraphy appeared in the mound fill, aside from a few lenses or pockets of sand or gravel indicating that some of the mound-builders had gone too deep for their filling material. No buried humus layers were present; each of the mounds had been raised in a single season, in all probability. Aside from the possibility of finding additional intrusive burials, a complete cross sectioning or removal of a quadrant section would have yielded little more information than we were able to obtain from the pits described.

Mound B is described first, as its contents present a simpler picture than that of Mound A (see Fig. 81, *c*, *d*, *e*).

MOUND B

At a depth of 15½ inches a human cranium, vertex up, was encountered (Burial 1). It doubtless had been intruded long after the mound had been built, possibly by a different culture-group than that responsible for the mound, or even by modern relic-seekers who had driven a deep but narrow burrow in from the mound summit to a depth of 72 inches, where they had considerately left a tin can. No pit outline could be found near this skull, however.

At about 60 inches, the floor of the 10 by 10 foot excavation revealed numerous boulders, 12 inches or more in diameter, in no apparent pattern, except that further excavation showed that they had been placed above and among a number of oak logs which had formed a roofing over the central burial pit (Fig. 82, *d*, *e*). Along with these boulders, near the northwest end of the underlying central pit and 12 inches above its rim, were a much disintegrated skull, vertebrae, and ribs of a bison; the bones were still more or less in articulation. They were splattered with a metallic-blue colored substance, possibly a paint (but as yet unanalyzed). In addition, the bison skull fragments had a

purplish-blue stain, suggesting a berry-juice paint.

The rim of the central burial pit was lined on its longer sides with a row of boulders averaging about 12 inches in diameter. Lying across the stone sill thus formed were seven or eight oak logs or beams (the exact number indeterminate because of the rotted condition of some) 12 to 15 inches wide, somewhat flattened (or trimmed) above and below, and 8 or 9 feet in length. These had formed the roof or covering for the chamber beneath.[2] Evidently the burial chamber had been hollow at the time the mound was built, but later seepage, wood-decay, and deep freezing of the soil had resulted in the collapse of the roof of logs, and the slumping of mound fill into the burial chamber. The line of breakage or bending of the logs was abrupt and followed the inner edge of the sill of boulders rimming the chamber.

The central burial pit of Mound B was a roughly elliptical chamber, 11 feet long on its north northeast–south southwest axis, and 5 feet wide (See Fig. 81, *e*). Its depth, measured from the original soil surface was 36 to 40 inches, the floor or bottom being uneven. The mound fill above the original soil surface rose 73 to 75 inches, so that the total depth of the floor of the burial chamber from the mound summit was 108 inches. It is likely that the depth from the mound summit was originally even greater, as there has undoubtedly been wind and water erosion of the mound surface.

The central chamber contained a mass of fragmentary, disarticulated, and partly rotted human skeletal material from persons of all ages and both sexes. This scrambled mass of bones was concentrated in the southern half of the chamber. Its lower portion had many empty spaces, not filled with soil from the slumped mound-fill, indicating that the burial chamber was intentionally left hollow, and that the logs were to prevent the filling of the chamber with soil from the over-lying mound.

The number of individuals represented in the burial could not have been much less than 20, but determination of the minimum number of different skeletons will require a very careful osteological check of apparently paired bones. Primary disposal may well have been on scaffolds or in trees, and the collection for reburial in the grave chamber over which a commemorative mound was erected may have been a ceremony carried out at intervals of many years.

Many of the bones had been liberally painted with red ocher, probably at the time of reburial, since the surfaces painted in some cases could not have been reached if the paint had been applied to the skin of a more or less intact corpse.

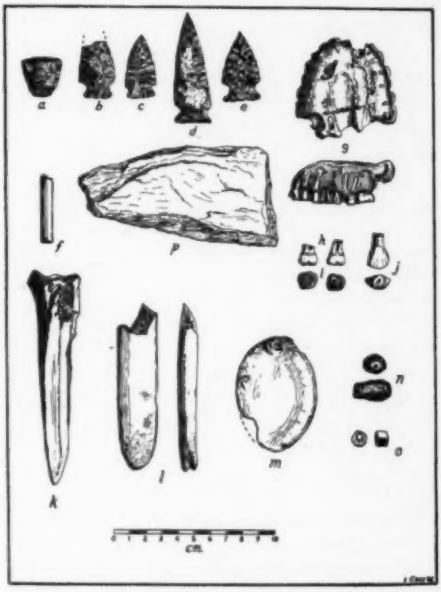


FIG. 82. Artifacts from Site 32-BA-1, North Dakota.

The meager list of artifacts includes: a copper bead (Fig. 82, *o*); a cylindrical clay(?) bead (Fig. 82, *n*); a crudely-chipped coarse-grained stone tool probably used as a digging implement in excavating the burial chamber (Fig. 82, *p*), one complete and one fragmentary bison-rib beaming (?) tool, found at the very bottom of the burial chamber, as if they had been left there after use in smoothing the sand floor (Fig. 82, *l*). The complete rib-tool had been scorched at one end.

A second intrusive burial (No. 2) was found at a depth of 47 inches near the relic-seeker's

[2] Logs may not have been the only roofing or covering. Bark, matting, or even hides may once have been present, though no macroscopic traces remained. See Voegelin (1944, pp. 339–72) for ethnographic descriptions of burial procedures in regions to the east and south.

burrow containing the tin can previously mentioned. It is possible that the poorly-preserved human skull and central shaft of a femur in this "burial" represented the contents of a deep shovel-thrust into the burial chamber below, reinterred at a shallower level.

MOUND A

Mound A exhibited the same feature as Mound B—a central burial chamber roofed with oak logs and containing a mass of disarticulated skeletal material, but it lacked the neat rim or sill of stones around the edges of the chamber. The remains inside were somewhat less well preserved than those in the burial chamber of Mound B, but more artifacts occurred with them.

In addition to the central chamber, Mound A contained a second and shallower grave-pit (depth 74 to 82 inches) just east of the edge of the chamber. This second grave-pit was not roofed, and its four adult skeletons were more or less articulated and well preserved. With them were fragments of at least two infant skeletons. The four adult skeletons had been buried simultaneously, side by side, with alternating orientation: Burial 1-A, face-down and farthest south, with the head to the west northwest; Burial 1-B, face to the north, head to the east southeast; Burial 1-C, face to the northeast, head to the west; and Burial 1-D, face up, head to the southeast. The skulls, vertebrae, ribs, and for the most part, the shoulder and hip-girdles, were in articulation; the limbs, however, were in nearly all cases partially disarticulated or laid in reverse, as if the legs and arms had been removed from their sockets and simply placed beside the heads and torsos. The

TABLE 19. SUMMARY OF CRANIAL MEASUREMENTS

	Specimens from Site 32-BA-1, Mound A					Skull from Mound near Valley City 32-BA-9(?)[d]
	Bur. 1-A	Bur. 1-B	Bur. 1-C	Bur. 1-D	Bur. 2	
Sex	F	M	M	M	Indet.	F
Age	36–55	36–55	20–35	36–55	36–55	36–55
Maximum cranial length	178	—[a]	182.5	—[b]	180	178
Maximum cranial breadth	146	—	136+	—	137.5	134
Basion-bregma height	132	—	—	—	—[c]	122
Total face height	119	125	118	126	—	104
Upper face height	75	78.5	74	77	—	68.5
Minimum frontal diameter	96	—	93+	93.5	92.5	91
Maximum face breadth	134	—	—	—	—	131
Nasal height	51	57.7	52.5	52.5	—	52
Nasal breadth	23	26.5	24	23	—	25
Orbital breadth (L)	43	—	40 (R)	42	—	44
Orbital height (L)	35	—	35.5 (R)	36	—	35
Bigonial diameter	85	98	92	94	—	98
Upper facial length	103	—	—	—	—	97
Mid-facial length	93	—	—	—	—	98.5
Cranial index	82	—	74.5	—	76	75.3
Mean height index	81.5	—	—	—	—	78.3
Facial index (total)	88.8	—	—	—	—	79.5
Cephalo-facial index	92	—	—	—	—	98
Nasal index	45	46	45.7	43.8	—	48
Orbital index (L)	81.5	—	86.3 (R)	85.7	—	79.5
Gnathic index	90	—	—	—	—	101

[a] Fragmentary on right side; much warped.
[b] Frontal, facial, and mandible only.
[c] Calotte only.
[d] Found around 1910 by Dr. J. M. Gillette.

condition of these skeletons suggests that they were secondary burials, already partly decomposed, but with enough ligaments left to keep vertebrae, feet, etc., in articulation. Measurements of the bones are given in Table 19.

Only one artifact occurred with these four burials—a brown chalcedony point like that in Figure 82, *e*, found beneath the head of a femur of Burial 1-C, but not in a position suggesting that it had been embedded in a wound suffered by that individual. A split, unworked beaver incisor was associated with Burial 1-A.

A sturdy bone tool with a blunt point (Fig. 82, *k*) was found at a depth of 51 inches in a vertical position, possibly having been dropped into the soft fill at the time the mound was being built. The remaining artifacts came from the material in the central burial pit, but in no particular association with the scattered human bones. A human molar tooth with a neatly ground-off root was recovered at a depth of 72 inches (Fig. 82, *i*). At a depth of 111 inches there was a marginally perforated river-mussel-shell disk ornament (Fig. 82, *m*), close to a more or less intact cranium. At a depth of 115 inches appeared a fragment of a bird-bone tube with adherent red ocher paint, four partly worked or ground carnivore teeth, and one unworked canine tooth of a very large carnivore, length 72.5 mm. (to broken root), probably Grizzly Bear. A polished bird-bone tube (Fig. 82, *f*); seven small, thin chalcedony flakes, smudged with red ocher; one quasi-scraper with thick ocher encrustation; a well-made end-scraper, also ocher-daubed, (Fig. 82, *a*); a large coarse flake; and point fragment with expanding base (Fig. 82, *b*); all of brown chalcedony (sometimes called Knife River Flint) were found at 116 inches.

At a depth of 118 inches, there was a small fragment of the alveolar portion of a human maxilla or mandible, ground flat at the level of mid-point of the tooth-roots. Two root-ground human teeth were found nearby, but did not fit the sockets of the alveolar fragment. At a depth of 122 inches, a complete upper dental arch and palate, consisting of a human maxilla carefully cut and ground down, along with its included teeth, forming an object resembling an "upper plate" of an artificial denture (Fig. 82, *g*). Near it were two brown chalcedony points (Fig. 82, *d* and *e*), finely worked. Another point, similar to Fig. 82, *d*, was turned up in the backdirt from the central burial pit (Fig. 82, *c*).

Scattered bison bone fragments were found in the mound fill above the central burial pit feature.

CONCLUSIONS

At this stage, with the tree-ring material from the burial-chamber logs unanalyzed and the physical anthropology of the intact and restorable skeletal material as yet incompletely studied, it is only possible to draw attention to structural parallels in other excavated mounds. Eventually, the dating of the two mounds by dendrochronology should throw light on the entire mound-building complex in eastern North Dakota, Southern Manitoba, and adjacent areas, even though the building of mounds doubtless covered several centuries.

Close similarities with the Baldhill mounds are notable in those excavated near Mitchell, South Dakota, by Meleen and Over. The Mitchell mounds exhibited the feature of a central subsurface pit or chamber roofed with logs; with their burials were included red ocher (admittedly not a very distinctive burial trait) and brown chalcedony points (Meleen, 1938, pp. 14–25). Wedel (1948*a*, pp. 11–13) calls attention to features in mounds excavated by the Smithsonian River Basin Surveys in South Dakota, near Wheeler Bridge, Fort Randall Reservoir area—sub-mound burial pits, secondary interments, and log grave coverings—which resemble those of the Baldhill site 32-BA-1.

Unfortunately, excavations of many North Dakota, Northern Minnesota, and Manitoba mounds have not been reported upon in detail, and an attempt to apply a trait-distribution technique to this subject would fail for lack of accurate information. Considerable variation in burial procedures and artifact associations are nevertheless borne out by the meager body of facts available.

Mounds excavated in the 1880's near Devils Lake, 80 miles north northwest of the Baldhill Area, yielded bark vessels and small, spirally-incised pots, together with tubular stone pipes, antler harpoons and wristlets, and shell artifacts of imported Gulf-coast mollusks (Montgomery, 1906). The absence of pottery at Site 32-BA-1 and the presence of the other artifact-types mentioned may therefore be culturally significant. The finds in low mounds at Arvilla, 70 miles north northeast of the Baldhills area, excavated by Jenks and Wilford in the early 1930's, likewise fail to correspond in structural or artifact features with 32-BA-1 (Wilford, 1941). Strong (1940) found painted bison skull

remains but no log-covering of the burial chamber in a mound near Lisbon, on the big bend of the Sheyenne River, 60 miles south southeast. E. Milligan excavated another mound in the same area, material from which is exhibited in the State Historical Museum at Bismarck; the array of shell and horn ornaments is quite unlike 32-BA-1, but may indicate cultural relationships with the Devils Lake mounds.

Other mound-burial material, again more like that from Devils Lake than from 32-BA-1, has been preserved in the Manitoba Museum, Winnipeg. Some of the Manitoba mounds were excavated by Montgomery, others by Nickerson. Recent archaeological work in that province, however, has been concerned chiefly with pottery-bearing occupational sites. Winchell's monumental compilation of Minnesota mound data contains several tantalizing references to construction details and recovered artifacts.

When the dating of the two 32-BA-1 mounds has been accomplished by dendrochronology, attempts at cultural identification of the builders will be more profitable.

Dept. of Sociology and Anthropology
University of North Dakota
Grand Forks, North Dakota

SOME PROVISIONAL CORRELATIONS IN MISSOURI BASIN ARCHAEOLOGY

WALDO R. WEDEL*

IN the Missouri River Basin, as elsewhere, the need for an accurate chronological framework for the understanding of archaeological relationships and cultural development is of primary importance. Because of the vastness of the area, the great diversity of materials from its various regions, and the relatively limited systematic work so far performed, no general Basin-wide chronological scheme of any preciseness is yet feasible. About the best we can do is to try to correlate a few locally developed sequences, and then if possible fit into this general picture some of the "floating" sequences and horizons. Complete coverage of the known archaeological remains of the Basin is manifestly impossible within the limits of a summary paper. It is hoped, however, that the remarks which follow may help to suggest trends developing as the evidence accumulates.

Several of the papers in the foregoing series arrived too late to be evaluated for purposes of this summary. Accordingly, I have altered somewhat my original plans. For the areas north of the Niobrara and west of the Signal Butte-Black Hills longitude, most of my remarks relate to synthesis of previous researches. With this very sketchy background, it is believed the reader will be in position to evaluate for himself the significance of the more recent findings.

The geographic break-down followed in the ensuing discussion is an arbitrary one. It conforms to no presently demonstrable archaeological sub-areas. If and when the latter are established, they will undoubtedly conform much more closely to drainage, vegetation, or other natural features than to such man-made entities as state boundaries.

Central Plains. For the region lying south of the Niobrara River and east of, approximately, the 103rd meridian, the general sequence of archaeological cultures, at least the later ceramic ones, has been known for some years. Three papers in the present series deal with localities here involved: Smith, on Kanopolis reservoir area on the Smoky Hill River, Kansas; Kivett, on Medicine Creek reservoir, Nebraska; and Champe, on Harlan County reservoir, on the Republican River in Nebraska. New data gathered by these workers have expanded our previous information, and in certain instances have further clarified the matter of chronology.

Smith has confirmed, through excavation, earlier unpublished records as to the presence of Woodland, Hopewellian, Upper Republican, and Great Bend aspect sites in the Kanopolis locality. Village or camp sites of all these horizons were found. They appear to be quite small, with relatively thin cultural deposits, and give the impression of short-lived occupations. While direct evidence of stratification of cultures appears to be rather scanty, it is note-

* Published by permission of the Smithsonian Institution.

worthy that some variation is reported among the Woodland sherds and projectile points. This accords with findings elsewhere, from which Central Plains archaeologists are beginning to see several variants within this now broad and vaguely defined category.

Of particular interest to Central Plains prehistory are the additional data regarding the time of the Great Bend Aspect and the Dismal River culture. From the Hayes site 10 miles northeast of Lyons, Kansas, Smith collected surface material of Great Bend Aspect type and a sherd of Rio Grande Late Glaze E or F pottery. At Spriggs Rocks near Little River, sherds of an olla of Late Glaze C to Early D were collected, but without other associated materials. These Southwestern specimens are in line with previous finds of Rio Grande tradeware at other Great Bend aspect sites in the locality, from which a time span of *ca.* 1475–1675 has been suggested (Wedel, 1947*a*).

For the Dismal River horizon, as represented at the Scott County Pueblo ruin, recent identification of painted sherds recovered by Williston and Martin a half century ago, apparently confirm a late seventeenth and early eighteenth century dating. Champe's work at a Dismal River site (25HN37) in Harlan County reservoir, Nebraska, unfortunately yielded no Southwestern sherds, though it did provide additional information on the material culture inventory and suggestions as to the form of habitation. Identity of the carriers of the Dismal River culture now seems well on the way to settlement. Several workers have been inclined for some time past to regard the Plains Apache as a much more likely prospect than the Comanche; and Champe has presented important ethno-historical data that seem to me virtually to clinch the matter.

On an earlier time level, Kivett's excavations at Medicine Creek have given us a much clearer notion as to the nature of the prehistoric Upper Republican occupancy. Here there is no suggestion of a thin, short-lived, or transient residency. Settlements of substantial sub-rectangular earth-lodges are scattered up and down the creek banks, as evidently on many other small streams of the Central Plains. A maize-bean-squash-sunflower horticulture furnished a relatively sure subsistence basis, so long as growing conditions were favorable; hunting, the gathering of shellfish, and collecting of local roots, nuts, and berries helped out. The somewhat scattered and loose character of the settlements, with two to four houses separated by a few rods from another similar cluster, is in striking contrast to the great, compact, often ditched and stockaded towns found in east-central Nebraska and along the Missouri by early White explorers. It is noteworthy that house construction on the Medicine seems often to have been haphazard, unlike the carefully laid out structures of the protohistoric and historic periods farther east. One wonders whether these village-dwellers were so preoccupied with making a livelihood that they had scant time for more careful work, or alternatively, were experimenting with a house complex that was still new, unfamiliar, and unformalized.

Concerning the Woodland locations on the Medicine, it may be noted that the occupation zone, though thicker than in the Upper Republican sites, yields far fewer artifacts and a shorter inventory of material remains. There is no direct evidence of horticulture, of substantial dwellings, or of definite midden areas. Small groups of people seem to be indicated; the area of occupation is characteristically so limited that scarcely more than three or four family units could have been accommodated. I have the impression of a rather uncertain hold on the region by a culturally simple group. In their use of calcite-tempered pottery, these people differed from those who dwelt at the Vy 1 site in Valley County, Nebraska, a fact which suggests relationship to some of the ossuary-using Woodland groups elsewhere in the upper Republican drainage.

Two points of general interest should be noted. One is the fact that a number of fairly large lodge-post sections were recovered from several of the Upper Republican house sites. It is possible that these will be amenable to dendrochronological analysis and correlation with the Christian calendar. Even if such a check on present time estimates for the horizon proves impracticable, it is hoped that intra-site or local inter-site datings can be made for correlation with the demonstrable artifact variations.

The other point is the matter of inter-areal relationships. Medicine Creek lies within the known geographic limits of Southwestern contacts in the Great Plains area. Yet despite the intensive and comprehensive archaeological coverage it has received, no recognizable Puebloan potsherds or other artifacts have been found in the Upper Republican and Woodland

horizons. They do occur, however, in later complexes of the region. In this, I think, lies further evidence that the small Upper Republican towns, and so perforce also the still earlier Woodland sites, antedate the mid-sixteenth century. They were probably contemporaneous with the late Black-on-White and early Glaze periods in the Rio Grande, where relatively small communities seem also to have been characteristic. Not until the middle Glaze periods, shortly before, during, and after the sixteenth century, was there demonstrable intercourse between the Central Plains Indians and those of the Rio Grande pueblos. And by that time, the village-dwellers in the Central Plains were *not* the Upper Republican peoples, but instead the Wichita of the Great Bend Aspect in Kansas, the Pawnee of the Lower Loup Focus in Nebraska, and the, probably, Apache of the Dismal River Aspect.[1]

Northern Plains. For what is commonly termed the upper Missouri River region, lying within the present states of North and South Dakota, the leads to native culture chronology and absolute dating are still tantalizingly meagre. It is abundantly clear that along the mainstem, beginning below the White River and continuing at least to the Yellowstone, there are many hundreds of aboriginal village and camp sites. Many of these are large, with or without defensive works, and are still more or less prominently marked by house pits, middens, and the litter of former human industry. Some were obviously inhabited during the White contact period; others are buried at varying depths beneath windblown soils and unquestionably antedate the coming of Europeans to the region. East of the Missouri are yet other remains, including numerous mounds as well as village sites; and there is growing evidence that the westerly tributaries were also peopled, if more thinly, at various times. The abundance and diversity of remains from these widely distributed sites makes it obvious that here there has been a long period of residence by semi-horticultural, as well as by non-horticultural, Indians.

Unfortunately, despite the very promising clues from surveys in the area, there has been relatively little systematic excavation on a scale commensurate with the problems involved. No single site has yet been comprehensively worked out and reported in detail. Most of the information now available is in the form of summaries and preliminary statements, or else is based very largely on survey sherd collections and limited test excavations. With one or two notable exceptions, site by site sherd counts are not given, and the associated artifact inventory is seldom stated or else lacks the desired fullness. This, as Strong has cogently observed, is scarcely the material from which "any really adequate chronological sequences of northern Plains cultures" can be developed. Nevertheless, the researches of Will, Strong, Meleen, Over, Hewes, and others, including the recent survey operations by Missouri River Basin Survey personnel, offer some clues toward a tentative working chronology. Three papers in the present series are concerned with this region. They include offerings by Cooper on Ft. Randall and lower Oahe reservoir areas, in South Dakota; by Meleen on the Thomas Riggs site in the lower Oahe reservoir; and by Hewes on mound excavations at Baldhill reservoir, North Dakota.

In the most recent and comprehensive attempt to synthesize the accumulating data on the Mandan area of North Dakota, four more or less distinct periods have been suggested (Will and Hecker, 1944). To the earliest period —termed Archaic Mandan—have been ascribed some 50 or more village sites between Grand River and the Knife. These lack fortifications, have rectangular houses widely spaced over the village area, and yield a simple pottery ware said to show Woodland, Mill Creek, and Nebraska culture traits. In the following, or Middle Mandan, period, represented by 30 or more sites from the Cannonball to the Knife, there is a transition from rectangular to circular houses, still widely spaced but usually in larger communities; fortifications, at first crude but later consisting of walls, ditches, and bastions, are often present; and pottery is more advanced, showing that the "Mandan ceramics had achieved definite individuality." Following this is the Late Heart River period, representing the time when the Mandan were living in six, eight, or more large, compact, fortified towns in the vicinity of Heart River. Closely spaced, sometimes superimposed, circular houses, and pottery with fine-cord decoration in the familiar "rainbow" motif, were characteristic. During this period, in the early 1700's (Will, 1924, p. 306), the Mandan first came to the notice of

[1] I have discussed at more length this and other phases of Central Plains-Southwestern archaeological relationships in a paper to be published elsewhere (Wedel, MS).

white men as a populous and important tribe dominating the region. Such large and impressive sites as Double Ditch, Sperry, Slant, and Larson, to mention only a few of many, are assigned to the period, which apparently represents the heyday of native Mandan Indian culture. With a suggested beginning date of *ca.* 1650 or earlier, this period lasted until approximately 1770, or about the time of the first serious smallpox epidemic. Following it came the Decadent Ceramic period, when the tribe, broken by smallpox and enemies, had been reduced to one, two, or three villages situated above Heart River.

Certain parallels are evident between this proposed Mandan sequence and that set up for the earth-lodge-using, pottery-making peoples of the Central Plains. Thus, the Archaic Mandan period suggests the Upper Republican-Nebraska culture horizon to the south, or the Middle Ceramic period of Champe (1946, p. 93 and Fig. 17). Middle Mandan correlates approximately with the protohistoric period in the Central Plains, where circular houses had already supplanted the rectangular, and where pottery was markedly better and more elaborate than in the preceding rectangular-house period. In the Central Plains, this horizon has been estimated to fall between *ca.* 1475 and 1675, or as the Late Ceramic of Champe, roughly between 1500 and 1700. Late Heart River would come partly in this same time zone and partly after it, in the historic period.[2]

For the Arikara and their predecessors in South Dakota, there is, so far as I know, no comparable published attempt at synthesis or at sequential arrangement of sites or periods. Often thought to be late arrivals on the upper Missouri, the Arikara now appear to have been in the region well before 1700. In historic times, i.e., after *ca.* 1770, they seem to have inhabited from one to three villages variously located from Cheyenne River northward. According to Tabeau (Abel, 1939, p. 123), the three "very mediocre" villages occupied at the time of his sojourn (1803–05) contained the remnants of "eighteen fairly large villages, situated upon the Missouri at some distance from each other"; and he further observes that "these three villages are today composed of ten different tribes" of Arikara. Strong (1940, p. 359) notes that they "dominated the region, living in a large number of great fortified villages during the middle of the eighteenth century. . . . " Of the localities investigated by Strong, the Leavenworth site is dated at 1804 and later; the Lower Cheyenne River site (visited by Trudeau in 1795) at *ca.* 1770; Buffalo Pasture and the huge Fort Sully site as "late protohistoric" and slightly earlier than Leavenworth; Arzberger as representing "a late prehistoric horizon, basically Upper Republican, but in process of development into the more specialized and later protohistoric Pawnee (to the south) and Arikara (in the north). . . . "

To me it seems exceedingly difficult to compress the history of Arikara culture, as that of a people distinct from the Pawnee, into anything less than three or four centuries. As with the Mandan, so with the Arikara there seems to have been in the latter eighteenth century a decrease in the number of villages occupied—and inferentially an increase in their size. By the last quarter of that century, they, like the Pawnee in Nebraska, were restricted to one to four large compact settlements. For the Mandan at least, this concentration of population seems already to have begun well before 1700; and I am inclined to doubt that the numerous large villages in the Arikara area were all as late as the eighteenth century. Meleen's work at La Roche[3] showed a complex apparently similar to Lower Loup, and Cooper's limited excavations at 39CH7 disclosed remains of simple-stamped pottery and circular houses within a fortified area. It seems probable that these materials are representative of a pre-contact horizon that is in the line of Arikara development and that, in my opinion, very likely preceded 1700. If Strong's suggestion regarding Arzberger is substantially correct, then the beginnings of Arikara culture must considerably antedate 1600, for there is every reason to suppose that the Pawnee were well into the Lower Loup phase of cultural development by the time of Coronado's entrada into the plains of central Kansas.

Recent investigations along the Missouri below Pierre suggest, as one might expect, that there is no sharp break or sudden transition between the culture complexes of Nebraska

[2] Will (1946) has suggested tree-ring dates for several North Dakota sites, among them: Slant Village (1652–1738), Sperry (1626–1675), Larson (1613–1641), all Late Heart River; Ward (1527–1563), transitional from Middle Mandan to Late Heart River; Huff (1485–1543), late Middle. These dates have been questioned by Bell (1948, pp. 104–8), but see Will, 1949, p. 164.

[3] For which site he postulates a mid-fifteenth century date (Meleen, 1948, p. 31).

and those in South Dakota. Near Chamberlain there is a buried site from which potsherds of Woodland type have been taken; and Meleen has noted the occurrence of other Woodland remains stratigraphically below Lower Loup-like pottery at Scalp Creek (Meleen, 1948, p. 26). At the Somers site, about 20 miles below Pierre, Meleen found evidence of rectangular house floors, from which came cord-roughened sherds strongly reminiscent of Upper Republican wares, bone fishhooks, notched and unnotched triangular projectile points, and other materials (Wedel, 1948*b*, p. 43). This would imply a close basic relationship between the Somers site complex and the Upper Republican horizon of Nebraska and Kansas. To judge from surface sherd collections made by Cooper in the vicinity of Brule Flats and elsewhere in Fort Randall reservoir area, there are other sites that may be expected to point, perhaps even more strongly, in the same direction. In at least one instance, Cooper found these cord-roughened wares underlying simple-stamped pottery and circular house floors (Wedel, 1948*b*, pp. 17–21).

All this would seem to suggest that in North and South Dakota, preceding the rectangular earth-lodge period, there was an earlier occupation by a people or peoples who made heavy, cord-roughened pottery, medium to large stemmed or corner-notched projectile points, and possessed other traits in a tradition similar to that broadly termed Woodland in the Central Plains. Moreover, Meleen's work in South Dakota and that of Kivett in Garrison reservoir above Bismarck (Wedel, 1948*b*, pp. 21–4), indicate that this presumed Woodland horizon underlies stratigraphically the remains of later peoples who used simple-stamped pottery and small triangular side-notched projectile points. Following[4] this as yet poorly defined Woodland-like occupancy came one characterized by rectangular earth-lodges and small, loosely arranged semi-permanent villages, the probable practice of horticulture, and the manufacture of a different kind of cord-roughened pottery. Here again there are many resemblances to the Central Plains, at the level of Upper Republican-Nebraska culture, dated as preceding the sixteenth century. Still later came the round-house period with simple-stamped pottery varying in details from locality to locality, and presumably involving the groups which became known in historic times as the Mandan and Arikara.

The mounds of eastern North and South Dakota present a problem of much interest and importance, but one that is not yet amenable to solution. Many of the burial structures opened by Montgomery (1906) in northeastern North Dakota are evidently quite late; as Strong has observed, there are relationships to the Arvilla focus materials of Minnesota (Wilford, 1941). Griffin, recognizing these similarities, has suggested a "Devils Lake Focus," which he dates in the mid-seventeenth century (Griffin, 1946, p. 70). That all the Dakota mounds can be assigned to such a late horizon and to a single focus has not yet been demonstrated. It seems possible that older horizons and perhaps different easterly mound complexes are also represented. There is a good deal of variability in the crania now available from some of the mounds, and the recently gathered materials of Cooper and Hewes are still to be analyzed and finally correlated. My feeling, in brief, is that not all the earthworks in the region represent a single seventeenth century diffusion from the late Woodland of Minnesota, but that several complexes and time periods are probably involved.

Northwestern Plains. Here we are concerned primarily with that portion of the Missouri Basin lying west of the longitude of the Black Hills. Comprising approximately one-third of the watershed, this is primarily a short-grass plains region, delimited on the west by the continental divide and interspersed here and there with detached forested mountain masses. In central Wyoming, where the mountain barrier is interrupted, the short grass gives way to sagebrush plains.

Preliminary and incomplete archaeological surveys have shown that there are numerous features of archaeological interest in this region (Wedel, 1948*b*). They include camp sites, both surface and buried; hearth areas; tipi ring groups; boulder alignments; quarries; and workshop stations of various kinds. Given suitable geologic conditions, one may also find caves, rock shelters, and pictographs. On open sites, chipped stonework and rejectage predominate; ground stone is less common, though steatite vessels and grinding implements sometimes occur; pottery is rare, but occurs sporadically in the Yellowstone Valley and elsewhere as

[4] This is inferential, based on the situation in the Central Plains; I know of no reported occurrence in the Dakotas of Woodland materials underlying rectangular houses.

far, at least, as central Montana. Earth-lodge village sites are apparently quite scarce, though one has been excavated near Glendive on the lower Yellowstone in eastern Montana (Mulloy, 1942). Bison kills are another widespread and interesting but as yet little known feature of the archaeology of the area.

The vast majority of occupational sites so far recorded indicate little depth of deposit and relatively short occupancy. This, combined with the absence or scarcity of potsherds which farther east have contributed materially to systematization of the data, has greatly hampered organization of our knowledge of the prehistory of the northwestern Plains. Enough information is at hand, however, to indicate that native man has utilized the game and other resources of the region during a very considerable span of time—a span dating back to the time when large mammals of species now extinct roamed the area. And, happily, there are a few stratified sites in which the rather variable artifact types usually found on single-component camp sites occur in stratigraphic relationship to one another. Full publication of data on several of these excavations should make sequential arrangement of cultures eventually possible.

We begin with the well-known Signal Butte in western Nebraska (Strong, 1935, pp. 224–39). Here a three-fold stratification of cultures affords an opportunity to tie in at the upper end with known pottery complexes to the east while the older underlying cultural deposits suggest clues to the sequence of lithic horizons to the north and west. On the surface were found a few glass beads and bits of trade copper. Below this, in a layer up to 18 inches thick, were Dismal River and Upper Republican potsherds, small triangular unnotched and side-notched projectile points, four-bladed chipped knives, a bone fishhook, and a variety of other specimens. While no stratigraphic separation of the two horizons represented was here possible, subsequent finds elsewhere have shown that the Dismal River complex is at least partly protohistoric and lasted into the early eighteenth century. Small unnotched triangular projectile points predominate. The Upper Republican culture with its predominantly side-notched points is everywhere prehistoric, and there seems no good reason to doubt that by 1500 A.D., or very soon thereafter, it had ceased to exist in western Nebraska. It would appear, therefore, that the uppermost level at Signal Butte (III) represents intermittent use by pottery-making peoples, beginning probably before the sixteenth century and continuing into the historic contact period.

The two lower levels at Signal Butte both lack pottery. Level II, as Strong notes, is "distinctive but as yet poorly defined." For our purpose, it is noteworthy that the characteristic points are stemmed and corner-notched, usually larger than the rather delicate points from the overlying pottery level. It is also to be noted that elsewhere in the Great Plains, the pre-Upper Republican Woodland horizon, or horizons, tend to have medium to large stemmed or corner-notched projectile points.

In Signal Butte I, perhaps representing more than one culture complex, the predominant point is a well-made medium to large lanceolate form, commonly with concave base; less common are corner-notched or stemmed points, the majority with concave base. Broken animal bones, chiefly bison, were very plentiful, and the level appears to have been used and re-used by hunting peoples over a long period.

Some 90 miles east of Signal Butte, at Ash Hollow Cave, the fill gives further stratigraphic confirmation of the Woodland-Upper Republican-Dismal River succession (Champe, 1946). Pre-pottery lithic horizons seem also to be indicated, possibly with corner-notched or stemmed projectiles preceding the smaller side-notched forms; but the artifact inventory is inadequate for purposes of identification or correlation.

North of Signal Butte, in the area surrounding the Black Hills, recent findings by Hughes, as described elsewhere in this series of papers, suggest a long occupancy by pre-pottery peoples followed by sporadic residence on the part of pottery-making groups. Pottery sites are small and scarce; the material remains unassigned but suggests one or more of the later, perhaps post-Upper Republican, horizons to the southeast. Further study and field investigation may reveal sites as early as Woodland, since sherds attributable to this horizon have been noted on White River in northwestern Nebraska (Champe, 1946, p. 64). Far more numerous, to judge from River Basin Survey findings in 1948, are non-pottery sites. Among these, there are groups of tipi rings, inferentially of fairly recent date; open camp sites on or just below the surface, marked by various kinds of stone-filled hearths, occasionally with roasting pits and usually with limited amounts of chipped

stone, animal bone, etc.; stratified camp deposits exposed in cut banks; quarries; and workshop sites. The discovery of a buried site (39FA65) on Horsehead Creek, tributary of the Cheyenne in Angostura Reservoir, where lanceolate point fragments and artifacts of apparent Plainview type occur *in situ*, is particularly noteworthy. Somewhat similar materials seem to be suggested from Edgemont and Keyhole Reservoir areas in nearby Wyoming, where further intensive work is needed. The faunal materials involved are not yet known.

One wonders whether among the more recent sites there may not be represented the remains of some of the late prehistoric or protohistoric Plains Apache, the Kiowa or Kiowa-Apache, and perhaps other of the pre-1800 tribes that seem to have roamed the region between the upper Platte and the Yellowstone. With accumulation of more detailed data and a thoroughgoing analytical study, it should become possible to work out a valid sequence of complexes that can be correlated with sequences elsewhere established. The Black Hills area, including the nearby upper reaches of the Cheyenne and its headwater tributaries, appears to have been an unusually favorable one for native peoples, presumably because of better water, wood, shelter, and food resources than exist in much of the semi-arid surrounding region. This, plus its strategic situation between the pottery-making complexes on the east and the non-pottery peoples to the west, would emphasize the desirability of an exhaustive study of the region.[5]

Farther west in Wyoming and Montana, archaeological sequences based upon controlled excavations are few indeed. Highly important, but unfortunately not yet reported in print, are the findings at the Indian Caves near Billings, Montana (briefly noted in Sayre, 1938; Mulloy and Lewis, 1943; Mulloy, 1943). Here, in cave deposits more than 13 feet deep, one historic and three prehistoric horizons have been recognized. Beginning with the earliest and oldest, they have been designated Pictograph Cave I, II, III, and IV. The later horizons yielded much perishable material; most of the sequence evidently represents pre-pottery occupations. For our present purpose, it is noteworthy that small, well-made, side-notched projectile points are characteristic of Pictograph Cave III and IV, as well as of "late ceramic horizons of the area." Large corner-notched convex-based points, somewhat reminiscent of those from Signal Butte II, are found in Pictograph Cave II. From Pictograph Cave I come lanceolate, concave-based, well-made forms resembling the predominating form from Signal Butte I and associated with Collateral Yuma blades. The metate and mano have been found in Pictograph Cave I, but "in later horizons they seem to have been replaced by the mortar and pestle" (Mulloy, 1943, p. 176).

Lying geographically between Signal Butte and Pictograph Cave is Birdshead Cave in the Owl Creek Mountains between Thermopolis and Shoshoni, Wyoming. Here, there are several thin cultural layers, separated by sterile deposits. A few potsherds of simple plainware occurred on the surface; below these, but in the upper levels were steatite vessel fragments, bits of animal-hair cloth, basketry, fiber cordage, small side- and base-notched points, and obsidian chips. At lower levels were found triangular points, then large side- or corner-notched stemmed forms, and finally, fragmentary concave-based specimens. There is a suggestion here of the same long-time change in projectile point forms that seems to be indicated elsewhere in the region; but the number of points found is very small, the artifact inventory is short, and the evidence is suggestive rather than definitive.

Until there is full publication of the Montana and Wyoming data, particularly where the cave and other stratified materials are involved, any correlations must remain highly tentative. As a provisional working hypothesis, based on the admittedly slim evidence of changing projectile point forms, it may be suggested that Pictograph Cave III and IV equate approximately, or in part, with Signal Butte III and Ash Hollow Cave Lenses A, B, and C. For these Nebraska locations, the time involved is within the past 600 to 800 years. Many of the bison-kills of the Montana-Wyoming region would seem to fall in this same general time period; others, and some of the deeper deposits, are quite probably much older. Pictograph Cave II may involve a northerly pre-pottery hunting complex roughly equivalent to that very incompletely represented by Signal Butte

[5] It is interesting to note that as late as 1800, the Arikara from the Missouri were participating in annual trading expeditions to the Black Hills, where they met the Cheyenne, Padouca, Kiowa, and other hunting tribes to barter tobacco, maize, guns, and the like for dried meat, dressed skins, quillwork, etc. (see Abel, 1939, p. 154).

II. The latter, as elsewhere noted, somewhat suggests a Woodland-like manifestation in its projectile point forms; in at least one place, such a correlation has been advanced, or at least strongly implied (Kroeber, 1948, p. 820). It is questionable, however, whether many archaeologists on present evidence would give the Plains Woodland-like horizons an antiquity much exceeding a thousand years. For Signal Butte II, on the other hand, correlation with a humid period of "about 5,000 years ago" has been suggested (Strong, 1936, p. 239). I regard any considerable lengthening of time estimates for the Woodland as less probable than a shortening of the estimate for Signal Butte II. If there is any validity in the two sets of estimates, then it would seem either that a Signal Butte II correlation with Woodland is in error; or else that the hunting horizon represented by Signal Butte II endured a very long time in the western Plains.

Continuing the suggested correlation based on projectile point forms, it would appear that Signal Butte I might equate approximately with Pictograph Cave I. For both, a considerable antiquity may be presumed. Strong (1935, p. 279) observes that the concave-based leaf-shaped points from Signal Butte I are "very similar in outline to the Folsom point," and suggests that they link this horizon "with other, and presumably earlier, cultures." From geological evidence, he suggests an antiquity of 7,000–10,000 years. Only recent animal species have been identified from this level. For Pictograph Cave I, I do not know the faunal associations or the estimated geologic dating, if other than Recent.

Considerable uncertainty still surrounds the earlier hunting horizons of the western Plains, such as the Folsom and the Yuma. Folsom artifacts have been found on the surface at a number of localities. At the Lindenmeier site near Ft. Collins, Colorado, and elsewhere outside the Missouri Basin, their association with extinct fauna of late Pleistocene and/or very early Recent times has been convincingly demonstrated (see summary in Roberts, 1940). In terms of years, their age has been variously estimated at from 10,000 to 25,000 years ago.

More numerous than Folsom in our area are localities where artifacts termed Yuma, or else regarded as related to them, have been found. At the Indian Caves near Billings, Stemmed or Collateral Yumas were associated with Pictograph Cave I, and the same association seems to be hinted for other localities in the Yellowstone drainage (Mulloy and Lewis, 1943, p. 298). At the Finley site, near Eden, Wyoming, the Collateral and Scottsbluff Yuma artifacts occurred in a stratum dated by Hack (1943, p. 241) as post-glacial. At Lindenmeier, Yuma points were few in number, but from their stratigraphic position, Roberts (1940, p. 64) was constrained to suggest that here, at least, "there was only a late contemporaneity between the Yuma and the Folsom, with a later survival for the Yuma."

In contrast to these and other occurrences, several Nebraska finds of Yuma artifacts with extinct species of bison have been reported. More recently, artifact finds here have been correlated with stream terraces for which, in turn, equivalence with Pleistocene erosional and depositional phenomena have been suggested. Thus, at three sites in the Medicine Creek reservoir area, including that reported by Holder in the present series of papers, the cultural materials are assigned by Nebraska paleontologists and geologists to the base of Republican River Terrace 2 (Schultz and Frankforter, 1948, p. 44), at a time "provisionally interpreted to be the interval immediately prior to or at the beginning of the Mankato substage of the Wisconsin stage of the Pleistocene glaciation" (Schultz, Lueninghoener, and Frankforter, 1948, p. 38). By this reckoning the sites in question would fall into Ray's Wisconsin II substage, much earlier than the Eden Valley Yuma of Hack (post-Wisconsin IV) or the Lindenmeier Folsom horizon (Wisconsin III). Furthermore, they would equate in time with the horse, the Columbian mammoth, and *Bison antiquus*, as the known stratigraphic position of these animals is given for Nebraska (Schultz, Lueninghoener and Frankforter, 1948, Fig. 6). The faunal material from the three Lime Creek sites (Ft-41, Ft-42, Ft-50) is noted as "of especial interest in the Great Plains region because for the first time an extensive fauna has been discovered in deposits of this [late Pleistocene] age, and directly associated with the fossil remains were numerous artifacts of Early Man" (Schultz and Frankforter, 1948, p. 44). However, among the 17 mammalian forms identified at the one Lime Creek site so far reported (Schultz and Frankforter, 1948, p. 46), we are told only that "preliminary observations suggest differences between several of the fossil and modern forms but positive identification must wait for further preparation

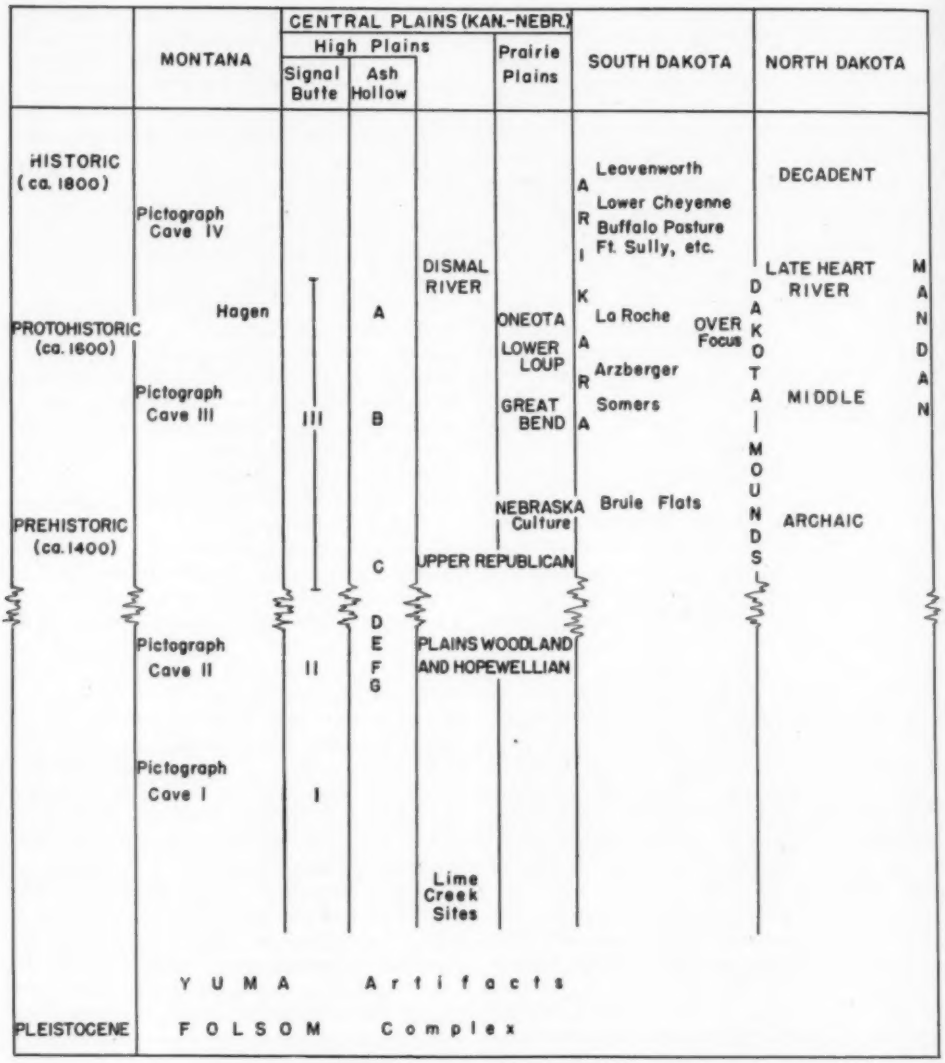


FIG. 83. A tentative correlation of certain archaeological horizons and sites in the Missouri River Basin.

and comparisons." So far as I am aware, bison horn cores or skulls sufficiently complete to make conclusive species identifications have not been recovered from the archaeological zones. Final placement of these interesting and important sites, with reference to Folsom, the Finley site, Signal Butte I, and other early pre-pottery horizons (i.e., Champe's proposed Early and Intermediate Lithic) must await further details concerning the circumstances of the findings.

Suggested correlations. In the accompanying chart (Fig. 83), I have tried to tie together a few of the threads of evidence presented, or suggested, in the foregoing pages. Included are some of the principal sites and horizons that

seem to me to have some claim to validity. Like all such attempts, where many of the basic data remain unpublished or have been published only in part or in preliminary fashion, there are a good many points at which the suggested correlations are open to argument. It is to be expected, therefore, that revisions—perhaps drastic ones—will be necessary as field research, laboratory analysis, and publication push ahead.

The core of this chart, where I feel reasonably sure of my ground with regard both to sequence and to time, is in the Central Plains section. Evidence in support of that line-up has been presented elsewhere (Champe 1946; Wedel, 1947*a*). For areas to the north, in the Dakotas, and to the west, in Wyoming and Montana, the correlations become less satisfactory, and the dates suggested must be regarded as, at best, tentative approximations only. Dates preceding what I believe to be the period of Upper Republican occupancy have been omitted, for lack of satisfactory evidence; possibly they should also have been deleted for this reason for a century or two later in the case of the northerly and westerly archaeological materials.

It should be noted that I have not attempted in this paper to appraise the validity of the cultural groupings, complexes, or horizons proposed or defined by other workers. For whatever use or misuse I may have made of their findings and views, I am alone responsible.

Discussion. From the very brief and incomplete survey presented in the foregoing pages, it is obvious that the half-million square miles comprising the Missouri River Basin contain a vast, and in many respects almost untapped, wealth of archaeological resources. Within the Basin there are cultural remains that evidently belong chronologically among the earliest human evidences yet found in the New World. At the other extreme, there are the village sites and burial places of sedentary town-dwelling Indians representing the final aboriginal occupants from whom the white man wrested the land. Between, is a long series of occupations of diverse character as well as of varying temporal and spatial extent. Our data on most of these, as has been brought out repeatedly in the present group of papers and elsewhere, are far too meagre as yet to enable us to reconstruct in any detail the long story of human effort and achievement that is represented. Since the presentations here made are largely in the nature of a progress report, I propose in this section merely to recapitulate in broadest outline the indications we have regarding the human prehistory, to note again some of the recent advances, and perhaps to indicate where some of the major problems lie.

Of perennial interest to archaeologist and laymen alike is the question of Early Man. As Kroeber has aptly put it, "The earlier date, the longer span, have an inherent attractiveness to most human minds." In the present series of papers, none deal with cultural materials for which a Pleistocene dating has been conclusively established, or association with extinct fauna demonstrated. Two of the papers, however, are devoted wholly or in part to lithic horizons which seem pretty certain to have a multi-millennial antiquity. These, and further controlled information from some of the many other non-pottery sites with which the westerly portions of the Basin abound,[6] will go far toward elucidating the much-discussed "gap," or series of gaps, which at present seem to intervene between Folsom and the much later pottery horizons along the eastern edge of the region. Meanwhile, what seems to be indicated is the presence during a very long span of time of relatively simple hunting, or hunting-gathering economies. This occupation began when large mammals of species long since extinct were available. It apparently continued, intermittently or otherwise, through a series of stages not now fully demonstrable, until the historic period with its mounted bison-hunters. There are hints that at some periods, or perhaps in certain localities, seed-grinding and the taking of small game may have been more important than the pursuit of big game. In the sagebrush region of central Wyoming, this may reflect the presence of a Basin group, such as the early Shoshoni. The meagerness of the artifact inventory from many of these sites, the apparent low specimen yield in proportion to the amount of excavation involved, and above all, the few sites so far intensively worked and reported, are serious obstacles to interpretative work. Where reasonably consistent and demonstrable time differences appear to exist, as shown by changing artifact types,

[6] The chronological position and cultural affiliations of the recently described Nebo Hill complex in northwestern Missouri remain uncertain; they suggest an eastern Plains preceramic complex that may affiliate with early horizons represented in the western Plains (Shippee, 1948).

sequential arrangement may be tried, as on the accompanying chart (Fig. 83).

Farther east, in what I have here called the Central and Northern Plains, we come face to face with a series of new problems. On present evidence, it would appear that throughout much, perhaps most of this region, pottery-making peoples roughly classified as Woodland, were the first ceramicists. Because the sites are small and often have a low artifact yield, they have been accorded relatively little systematic attention by trained excavators. It is clear, however, that a number of variants exist, as shown by differences in the pottery, projectile point types, and other artifacts. The several variants, however, have nowhere been adequately defined, and their temporal and other relationships to one another remain obscure. Possibly they reflect a relatively long occupancy marked by a slowly changing cultural inventory. As a broad "horizon" label, the term Woodland is perhaps still acceptable; but the point is approaching, if indeed it has not been passed, where one will have to specify which variant of Woodland is being referred to.[7]

Of direct connection between the Woodland and presumably contemporaneous Hopewellian manifestations, on the one hand, and the later ceramic complexes of the Central and Northern Plains, on the other hand, there seems at present little evidence. As Kivett has suggested, it is possible that both Woodland and Upper Republican peoples in the Nebraska-Kansas region practiced ossuary burial, though with certain differences in detail. At the moment, this would seem a more promising clue to continuity than the resemblances noted by Griffin (1946, p. 67) between Hopewellian and Upper Republican pot rim decoration. Insofar as the Kansas City Hopewell horizon appears also to be considerably richer, both qualitatively and quantitatively, than most of the trans-Missouri Woodland sites so far worked, it brings to mind the post-Woodland occupancies of the Plains area.

In Hopewell, as evidently in most of the post-Woodland Plains ceramic horizons, we are concerned largely with semi-horticultural complexes. Throughout the Kansas-Nebraska region, post-Woodland sites are marked by a definitely prehistoric phase, during which the people resided in small, unfortified, often loosely arranged communities of rectangular dwellings. Maize, beans, squash, and sunflowers were cultivated; hunting was probably of secondary importance, and the gathering of wild plant foods is indicated. This small-town stage, which has been tentatively assigned in the Central Plains to the thirteenth, fourteenth, and fifteenth centuries, appears to have had a counterpart along the Missouri in North and South Dakota; but whether equally early there and in sites east of the Missouri is not now certain.

By the time of Coronado's entrada into the Great Plains, the Arkansas Valley in central Kansas and the Platte in east central Nebraska were the seats of large aggregations of semi-horticultural peoples. A well developed and intensive maize agriculture, evidently with considerable crop surpluses, formed the main subsistence basis, although hunting and gathering were also carried on extensively. In central Kansas, the Great Bend Aspect peoples (Wichita) were in contact with Puebloan peoples of the Rio Grande valley. On the Platte, the Pawnee were apparently gathering into large towns, then or soon to be, protected with stockades and ditches. On the upper Missouri, there also appears to have been a shift from the small community pattern to the larger, often fortified towns. Whether this occurred concurrently with the presumed pre-sixteenth century shift in the Central Plains is not now clear. Neither is it clear to me at the moment just where such complexes as that at the Mitchell site, in eastern South Dakota, and at the Hagen site, eastern Montana, fit into this picture. I would suspect that both, as well as most of the mounds in the eastern Dakotas, precede 1650, but this is only a guess.

With the seventeenth century, we arrive on the threshold of the historic, or white contact, period. Here the task becomes one of linking the archaeological record with the documentary, of correlating late material culture complexes with the various tribal units known or thought to have inhabited certain localities. Historic records are replete with intriguing leads that with further work may explain late, but still unidentified, archeological manifestations in the western Plains, about the Black Hills and elsewhere. The horse, the gun, and the extensive

[7] Schultz and Spaulding (1948, pp. 306–13) have recently called attention to a complex in the lower Republican Valley of eastern Kansas that suggests kinship with the pre-Hopewellian Eastern Archaic. Of this, no additional evidence has been recognized elsewhere in the Missouri Basin.

tribal re-alignments and adjustments associated with the advance of the white man all contributed to a rapidly changing ethnic and cultural picture. For this reason, it seems to me that one of the particularly encouraging developments in Plains archaeology is the archaeological "profile" that may soon be possible from the Arkansas to the Knife on the protohistoric level. There are fairly sizable collections available from the Great Bend Aspect (Wichita) in central Kansas, the Lower Loup focus (Pawnee) in east central Nebraska, and the Dhegiha Siouan (Omaha-Ponca) locale in northeastern Nebraska. Meleen's work at Scalp Creek, La Roche, and elsewhere, that by Strong and Spaulding at Buffalo Pasture and nearby sites, and the findings by River Basin Surveys personnel in Fort Randall and the lower Oahe reservoir areas hold promise for a successful extension of correlations into the heart of the Arikara area. These in turn will have to be connected with the Mandan sequence, when that has been backed up with more comprehensive and definitive archaeological samples excavated from sixteenth and seventeenth century sites. It is perhaps too early yet to attempt such far-flung correlations, except as a provisional working hypothesis, but the prospects eventually to be realized are most intriguing.

Needless to say, there are many other facets of prehistory in the Missouri River Basin which cannot be touched on within the limits of a paper such as this. Disregarding for the moment those which are primarily archaeological in nature, we may note briefly the non-existence from most known horizons or sites of really definitive data concerning the physical anthropology of the peoples involved. There are indications that in the Central Plains long-headed Woodland and Hopewellian populations preceded broad-headed Upper Republican and other peoples, the latter perhaps occasionally practicing occipital deformation. But for most of the area we know nothing, or at best distressingly little, regarding the appearance of the people themselves. Of growing importance, too, are the climatological, geological, and ecological ramifications of the archaeological data. It is perfectly evident that the special skills of observers experienced in all these lines will have to be increasingly called upon.

Archaeologically speaking, three major problems may be cited in closing. There is, first of all, the matter of standardized classification and terminology in the analysis of the archaeological materials. Secondly, there is a great need for full publication of the results of past excavations in the region. Third, it is imperative that there be comprehensive and systematic excavation of additional key sites, carefully selected to give us trustworthy cultural inventories from various localities and time levels. This last problem, because of the rapid acceleration of the Federal water-control program and the consequent early obliteration of hundreds of sites, becomes one of the utmost urgency. It vividly points up the great obligation with which American archaeology is currently faced and the unparalleled opportunity with which it is simultaneously presented in the river valley salvage program.

River Basin Surveys
Smithsonian Institution
Washington, D. C.

BIBLIOGRAPHY

The following abbreviations are used:

AA	*American Anthropologist*, New Series. Menasha.
AAN	AMERICAN ANTIQUITY. Menasha.
BAE-AR	*Bureau of American Ethnology, Annual Report*. Washington.
BAE-B	*Bureau of American Ethnology, Bulletin*. Washington.
CNA	*Chapters in Nebraska Archaeology*. Lincoln.
NHM	*Nebraska History Magazine*. Lincoln.
SI-EFW	*Smithsonian Institution, Explorations and Field Work*. Washington.
SMC	*Smithsonian Miscellaneous Collections*. Washington.
SMP	*Southwest Museum Papers*. Los Angeles.
UNSM-B	*University of Nebraska State Museum, Bulletin*. Lincoln.
USDM-AS	*University of South Dakota Museum, Archeological Studies*. Vermillion.

ABEL, A. H., Editor

1939. *Tabeau's Narrative of Loisel's Expedition to the Upper Missouri*. Norman: University of Oklahoma Press.

AMSDEN, C. A.

1935. "The Pinto Basin Artifacts." *SMP*, No. 9, pp. 33–50.

1937. "The Lake Mohave Artifacts." In "The Archeology of Pleistocene Lake Mohave" by E. H. Campbell *et al*. *SMP*, No. 1, pp. 51–97.

ANONYMOUS

1914. "Trudeau's Journal." *South Dakota Historical Collections*, Vol. 7, pp. 403–74.

BACON, S. R., AND OTHERS.

1939. *Soil Survey, Frontier County, Nebraska*. Washington: U. S. Department of Agriculture.

BAUXAR, J. J.

1947. *Preliminary Appraisal of the Archeological and Paleontological Resources of Angostura Reservoir, Fall River County, South Dakota*. Manuscript prepared by Missouri Valley Project, River Basin Surveys, Smithsonian Institution, for Missouri River Basin Recreation Survey, Region Two, National Park Service. Lincoln.

MS. *Introduction to the History of the Missouri River Valley, 1673–1806*. Manuscript on file at field headquarters of the Missouri Valley Project, Burnett Hall, University of Nebraska, Lincoln.

BEARDSLEY, RICHARD K.

1948. "Cultural Sequences in Central California Archaeology," AAN, Vol. 14, No. 1, pp. 1–28.

BELL, ROBERT E.

1948. Review of "Tree Ring Studies in North Dakota." *AA*, Vol. 50, No. 1, Pt. 1, pp. 104–8.

BIRD, JUNIUS

1938. "Antiquity and Migrations of the Early Inhabitants of Patagonia." *Geographical Review*, Vol. 28, No. 2, pp. 250–75. New York.

1946. "The Archeology of Patagonia." In "The Handbook of South American Indians," Vol. 1, pp. 17–24. *BAE-B*, No. 143.

BLISS, W. L.

MS. *Re-evaluation of Signal Butte in Light of New Evidence*. Manuscript in the possession of the author.

BLISS, W. L., AND J. T. HUGHES

MS. "Archeology of Birdshead Cave, Fremont County, Wyoming." Manuscript on file at field headquarters of the Missouri Valley Project, Burnett Hall, University of Nebraska, Lincoln.

BREW, J. O., AND OTHERS

1947. "Symposium on River Valley Archeology." AAN, Vol. 12, No. 4, pp. 209–25.

BUKER, L. W.

1937. "Archeology of the Southern Black Hills." AAN, Vol. 3, No. 1, pp. 79–80.

BURPEE, L. J., Editor

1927. *Journals and Letters of Pierre Gaultier de Varennes de la Verendrye and His Sons*. Toronto: The Champlain Society.

CHAMPE, JOHN L.

1946. "Ash Hollow Cave." *University of Nebraska Studies*, New Series, No. 1. Lincoln.

COOPER, P. L.

1936. "Archeology of Certain Sites in Cedar County, Nebraska." *CNA*, Vol. 1, No. 1, pp. 11–145.

DORSEY, J. O.

1884. "Omaha Sociology." *BAE-AR*, No. 3 (1881–82), pp. 205–370.

DUNLEVY, M. L.

1936. "Comparison of Cultural Manifestations of the Burkett and the Gray-Wolfe Sites." *CNA*, Vol. 1, No. 2, pp. 147–247.

FLETCHER, ALICE C., AND FRANCIS LA FLESCHE

1911. "The Omaha Tribe." *BAE-AR*, No. 27 (1905–06).

FOWKE, GERARD

1928. "Archeological Investigations—II." *BAE-AR*, No. 44 (1926–27), pp. 399–540.

GREENMAN, E. F.

1937. "The Younge Site; an Archaeological Record from Michigan." *Occasional Contributions from the Museum of Anthropology of the University of Michigan*, No. 6. Ann Arbor.

GRIFFIN, JAMES B.

1946. "Cultural Change and Continuity in Eastern United States Archaeology." In "Man in Northeastern North America," edited by Frederick Johnson. *Papers of the R. S. Peabody Foundation of Archaeology*, Vol. 3, pp. 37–95. Andover.

GRINNELL, G. B.

1915. *The Fighting Cheyennes*. New York.

1923. *The Cheyenne Indians*. New Haven: Yale University Press.

HACK, JOHN T.
1943. Antiquity of the Finley Site. AAN, Vol. 8, No. 3, pp. 235–41.

HARRINGTON, J. P.
1940. "Southern Peripheral Athapaskawan Origins, Divisions, and Migrations." *SMC*, Vol. 100, pp. 503–32.

HIBBEN, F. C.
1941. "Evidences of Early Occupation in Sandia Cave, New Mexico and Other Sites in the Sandia-Manzano Region." *SMC*, Vol. 99, No. 23.

HILL, A. T., AND PAUL COOPER
1936. "The Schrader Site." *NHM*, Vol. 17, No. 4, pp. 223–52.

HILL, A. T., AND MARVIN F. KIVETT
1941. "Woodland-Like Manifestations in Nebraska." *NHM*, Vol. 21, No. 3, pp. 143–243.

HILL, A. T., AND G. METCALF
1942. "A Site of the Dismal River Aspect in Chase County, Nebraska." *NHM*, Vol. 22, No. 2, pp. 158–226.

HILL, A. T., AND W. R. WEDEL
1936. "Excavations at the Leary Indian Village and Burial Site, Richardson County, Nebraska." *NHM*, Vol. 17, No. 1.

HOLDER, PRESTON
1948. *The Allen Site: Archeological Evidence of an Early Hunter's Camp on Medicine Creek, Frontier County, Nebraska*. Paper read at the Sixth Plains Archeological Conference, Nov. 25–27, University of Nebraska, Lincoln.

HUGHES, J. T.
MS. *Tentative Correlation of Climatic, Geological, and Archeological Events Reported at Certain Localities in the Western United States*. Manuscript in the possession of the author, Lincoln.

KELLEY, J. C.
1947. "The Cultural Affiliations and Chronological Position of the Clear Fork Focus." AAN, Vol. 13, No. 2, pp. 97–109.

KIVETT, MARVIN F.
1947. *Preliminary Appraisal of the Archeological and Paleontological Resources of the Harlan County Reservoir, Nebraska*. Prepared by Missouri Valley Project, River Basin Surveys, Smithsonian Institution, for Missouri River Basin Recreation Survey, Region Two, National Park Service. Lincoln.
1948. *Preliminary Appraisal of the Archeological and Paleontological Resources of the Baldhill Reservoir, North Dakota*. Lincoln: River Basin Survey, Smithsonian Institution (mimeographed).

KIVETT, M. F., AND J. T. HUGHES
1947. *Preliminary Appraisal of the Archeological and Paleontological Resources of Certain Proposed Reservoir Areas in the Lower Platte Sub-Basin, Nebraska*. Prepared by Missouri Valley Project, River Basin Surveys, Smithsonian Institution, for Missouri River Basin Recreation Survey, Region Two, National Park Service. Lincoln.

KRIEGER, HERBERT W.
1928. "A Prehistoric Pit House Village Site on the Columbia River at Wahluke, Grant County, Washington." *United States National Museum, Proceedings*, Vol. 73, Art. 11, pp. 1–29. Washington.

KROEBER, A. L.
1948. *Anthropology*. New York.

MALLERY, GARRICK
1893. "Picture Writing of the American Indians." *BAE-AR*, No. 10 (1888–89).

MARGRY, PIERRE, Editor
1888. *Mémoires et documents pour servir à l'histoire des origines françaises des pays d'outre-mer*. Paris.

MARTIN, H. T.
1909. "Further Notes on the Pueblo Ruins of Scott County, Kansas." *University Science Bulletin*, Vol. 5, No. 2. Lawrence: University of Kansas.

MARTIN, PAUL S.; GEORGE I. QUIMBY; AND DONALD COLLIER
1947. *Indians before Columbus*. Chicago: University of Chicago Press.

MELEEN, ELMER E.
1938. "A Preliminary Report of the Mitchell Indian Village Site and Burial Mounds." *USDM-AS*, Circular 2, pp. 1–34.
1948. "A Report on an Investigation of the La Roche Site, Stanley County, South Dakota." *USDM-AS*, Circular 5.

METCALF, GEORGE
1949. "Three Pottery Types from the Dismal River Aspect." *Proceedings of the Fifth Plains Conference for Archeology*, edited by John L. Champe (in press).

MONTGOMERY, HENRY
1906. "Remains of Prehistoric Man in the Dakotas." *AA*, Vol. 8, No. 4, pp. 640–51.
1908. "Prehistoric Man in Manitoba and Saskatchewan." *AA*, Vol. 10, No. 1, pp. 33–40.

MOTT, MILDRED
1938. "The Relation of Historic Indian Tribes to Archaeological Manifestations in Iowa." *Iowa Journal of History and Politics*, Vol. 36, No. 3, pp. 227–315. Des Moines.

MULLOY, WILLIAM
1942. "The Hagen Site." *University of Montana Publications in Social Science*, No. 1. Billings.
1943. "A Prehistoric Campsite near Red Lodge, Montana." AAN, Vol. 9, No. 2, pp. 170–9.
MS. *Some Ancient Caves in the Yellowstone Valley*. Manuscript on file at field headquarters of the Missouri Valley Project, Burnett Hall, University of Nebraska, Lincoln.

MULLOY, WILLIAM, AND O. T. LEWIS
1942. "Early Types of Points from the Lower Yellowstone Country." AAN, Vol. 8, No. 3, pp. 298–9.

NELSON, N. C.
1943. "Contribution to Montana Archeology." AAN, Vol. 9, No. 2, pp. 162–9.

OVER, W. H.
1941. "Indian Picture Writing in South Dakota." *USDM-AS*, Circular 4.

RAY, C. N.
1938. "The Clear Fork Culture Complex." *Bulletin of the Texas Archeological and Paleontological Society*, Vol. 10, pp. 193–207. Abilene.

RENAUD, E. B.
1936. "Southern Wyoming and Southwestern South Dakota." *The Archaeological Survey of the High Western Plains*, Seventh Report. Denver: University of Denver, Department of Anthropology.

ROBERTS, F. H. H., JR.
1940. "Developments in the Problem of the North American Paleo-Indian." *SMC*, Vol. 100, pp. 51–116.
1941. "Latest Excavations at Lindenmeier Site Add to Information on the Folsom Complex." *SI-EFW* in 1940, pp. 79–82.
1943. "A New Site." In "Notes and News." AAN, Vol. 8, No. 3, p. 300.

SAYLES, E. B.
1935. "An Archeological Survey of Texas." *Medallion Papers*, No. 17. Globe, Arizona.

SAYRE, H. M.
1938. In "Notes and News." AAN, Vol. 3, No. 3, p. 278.

SCHULTZ, C. B., AND W. D. FRANKFORTER
1948. "Preliminary Reports on the Lime Creek Sites: New Evidence of Early Man in Southwestern Nebraska." *UNSM-B*, Vol. 3, No. 4, Pt. 2, pp. 43–60.

SCHULTZ, C. B.; G. C. LUENINGHOENER; AND W. D. FRANKFORTER
1948. "Preliminary Geomorphological Studies of the Lime Creek Area." *UNSM-B*, Vol. 3, No. 4, Pt. 1, pp. 31–42.

SCHULTZ, C. B., AND T. M. STOUT
1945. "Pleistocene Loess Deposits of Nebraska." *American Journal of Science*, Vol. 243, pp. 231–44. New Haven.

SCHULTZ, FLOYD, AND ALBERT C. SPAULDING
1948. "A Hopewellian Burial Site in the Lower Republican Valley, Kansas." AAN, Vol. 13, No. 4, pp. 306–13.

SELLARDS, E. H.; G. L. EVANS; G. E. MEADE; AND A. D. KRIEGER
1947. "Fossil Bison and Associated Artifacts from Plainview, Texas." *Bulletin of the Geological Society of America*, Vol. 58, pp. 927–54. New York.

SHIPPEE, J. M.
1948. "Nebo Hill, a Lithic Complex in Western Missouri." AAN, Vol. 14, No. 1, pp. 29–32.

SMITH, E. R.
1941. "The Archeology of Deadman Cave." *Bulletin of the University of Utah*, Vol. 32, No. 4. Salt Lake City.

SMITH, HARLAN J.
1907 (?). *The Data of the Archaeology of the Dakotas*. New York: American Museum of Natural History.

STRONG, W. D.
1933. "Signal Butte, a Prehistoric Narrative in the High Plains." *SI-EFW* in 1932, pp. 151–8.
1935. "An Introduction to Nebraska Archeology." *SMC*, Vol. 93, No. 10.
1940. "From History to Prehistory in the Northern Great Plains." *SMC*, Vol. 100, pp. 353–94.

THOMAS, ALFRED B.
1935. *After Coronado*. Norman: University of Oklahoma Press.

THWAITES, R. G., Editor
1904. *Original Journals of the Lewis and Clark Expedition, 1804–1886*. New York.
1906. "Maximilian, Prince of Wied's Travels in the Interior of North America, 1832–1834." *Early Western Travels, 1748–1846*, Vol. 22.

UDDEN, J. A.
1900. *An Old Indian Village*. Rock Island.

VOEGELIN, ERMINIE W.
1944. "Mortuary Customs of the Shawnee and Other Eastern Tribes." *Indiana Historical Society*, Vol. 2, No. 4. Indianapolis.

WAGNER, HENRY R.
1937. *The Spanish Southwest 1542–1794*. Albuquerque: The Quivira Society.

WEAKLY, HARRY E.
1946. "A Preliminary Report on the Ash Hollow Charcoal." In Champe, 1946, pp. 105–10.

WEBB, WILLIAM S.
1939. "An Archeological Survey of Wheeler Basin on the Tennessee River in the Northern Alabama." *BAE-B*, No. 122.

WEDEL, W. R.
1934*a*. "Preliminary Classification for Nebraska and Kansas Cultures." *NHM*, Vol. 15, No. 3, Appendix, pp. 251–55.
1934*b*. "Preliminary Notes on Archeology of the Medicine Valley in Southwestern Nebraska." *NHM*, Vol. 14, No. 3, pp. 144–66.
1935*a*. "Contributions to the Archaeology of the Upper Republican Valley, Nebraska." In Wedel, 1935*b*, pp. 133–209.
1935*b*. "Reports on Fieldwork by the Archeological Survey of the Nebraska State Historical Society, May 1–July 23, 1934." *NHM*, Vol. 15, No. 3, pp. 132–255.
1935*c*. "Salina I: a Protohistoric Village Site in McPherson County, Kansas." In Wedel, 1935*b*, pp. 238–50.
1940*a*. "Archeological Explorations in Western Kansas." *SI-EFW* in 1939, pp. 83–6.
1940*b*. "Culture Sequence in the Central Great Plains." *SMC*, Vol. 100, pp. 291–352.
1941. "Environment and Native Subsistence Economies in the Central Great Plains." *SMC*, Vol. 101, No. 2.
1942. "Archeological Remains in Central Kansas and

their Possible Bearing on the Location of Quivira." *SMC*, Vol. 101, No. 7.

1943. "Archeological Investigations in Platte and Clay Counties, Missouri." *United States National Museum, Bulletin*, No. 183. Washington.

1947*a*. "Culture Chronology in the Central Great Plains." AAN, Vol. 12, No. 3, pp. 148–56.

1947*b*. "Note on Some Potsherds from Northeastern Wyoming." *Journal of the Washington Academy of Sciences*, Vol. 37, No. 5, pp. 157–9. Washington.

1947*c*. "Prehistory of the Missouri Valley Development Program: Summary Report on the Missouri River Basin Archeological Survey in 1946." *SMC*, Vol. 107, No. 6.

1948*a*. "Archaeological Fieldwork in the Missouri River Basin in 1948." *Plains Archeological Conference, News Letter*, Vol. 1, No. 5, pp. 11–13. Omaha.

1948*b*. "Prehistory and the Missouri Valley Development Program: Summary Report on the Missouri River Basin Archeological Survey in 1947." *SMC*, Vol. 111, No. 2.

1948*c*. "Some Central Plains Sherd Types from Kansas." *Proceedings of the Fifth Plains Archeological Conference*. Lincoln.

MS. *Notes on Some Plains-Southwestern Contacts in the Light of Archeology*. Manuscript in the U. S. National Museum, Washington.

WHITE, T. E., AND J. T. HUGHES

MS. *A Preliminary Appraisal of the Physiographic History of Horsehead Creek in the Vicinity of 39FA65*. Manuscript on file at field headquarters of the Missouri Valley Project, Burnett Hall, University of Nebraska, Lincoln.

WILFORD, L. A.

1941. "A Tentative Classification of the Prehistoric Cultures of Minnesota." AAN, Vol. 6, No. 3, pp. 231–49.

1945. "Three Villages of the Mississippi Pattern in Minnesota." AAN, Vol. 11, No. 1, pp. 32–40.

WILL, G. F.

1924. "Archeology of the Missouri Valley." *Anthropological Papers of the American Museum of Natural History*, Vol. 22, pp. 285–344. New York.

1946. "Tree Ring Studies in North Dakota." *Agricultural Experiment Station, North Dakota Agricultural College, Bulletin*, No. 338. Fargo, North Dakota.

1949. "A Reply to Bell's Review." *AA*, Vol. 51, No. 1, p. 164.

WILL, G. F., AND T. C. HECKER

1944. "Upper Missouri River Valley Aboriginal Culture in North Dakota." *North Dakota Historical Quarterly*, Vol. 11, Nos. 1 and 2, pp. 5–126.

WILL, G. F., AND H. J. SPINDEN

1906. "The Mandans: a Study of Their Culture, Archaeology, and Language." *Papers, Peabody Museum of American Archaeology and Ethnology*, Vol. 3, No. 4. Cambridge.

WINCHELL, N. H.

1911. *The Aborigines of Minnesota*. St. Paul: Minnesota Historical Society.

WORMINGTON, H. M.

1944. "Ancient Man in North America." *The Colorado Museum of Natural History, Popular Series*, No. 4. Denver.

1948. "A Proposed Revision of Yuma Point Terminology." *Proceedings, Colorado Museum of Natural History*, Vol. 18, No. 2. Denver.

FACTS AND COMMENTS

A HOPEWELL TOOL FOR DECORATING POTTERY

Wedel and Trowbridge[1] described a prehistoric rouletting tool from a Hopewellian site in Wyandotte County, Kansas. This rouletting tool of bone was circular with a notched stamping edge and an attached handle that served also as an axle for the stamping wheel. The discovery of this tool, according to the authors, substantiated rouletting on

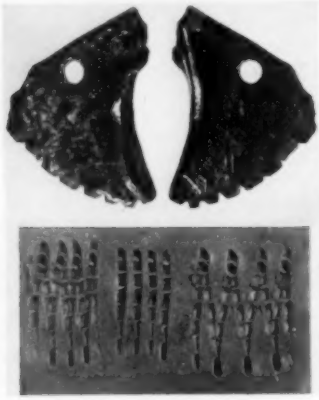


FIG. 84. Hopewell roulette.

the principle of wheel-rolling, as originally deduced by Holmes in 1892.

In the collections of the Chicago Natural History Museum there is a Hopewell rouletting tool that may represent a borderline case of the principle of rouletting by wheel-rolling. This tool was excavated from Mound 25 of the Hopewell Group in Ross County, Ohio by Warren K. Moorehead in 1891–92 and until the present time remained unidentified in a miscellaneous collection of fragmentary Hopewell artifacts stored in the Museum.

The newly identified rouletting tool is in the form of a sextant rather than a whole circle or wheel (Fig. 84). The arc of the sextant is notched and there is a round, smooth perforation near the apex of the sextant, presumably for the insertion of an axle. The maximum length of this tool is 2.9 cm. and the maximum width is 2.6 cm. It is made of bone that has been carbonized. The bone has been modified extensively so that identification is impossible, but one might guess that the implement had been made from the proximal end of a deer ulna.

Experiments conducted with this rouletting tool and some plastic modeling clay indicated that rocked dentate stamp (roulette) impressions (Fig. 84) could easily be produced by rocking the stamp, either with the aid of an axle inserted through the hole near the apex or by merely holding the tool between one's thumb and forefinger. The rocked dentate stamp or roulette impressions made with this tool are shown in the plaque of plastic clay (Fig. 84) and on the facsimile section of a Hopewell jar (Fig. 85) made by Mr. John Pletinckx, Ceramic Restorer in the Museum's Department of Anthropology. The impressions

FIG. 85. Section of a facsimile Hopewell pot showing rouletting.

are markedly similar to those found on certain styles of Hopewellian pottery.

If this sextant-shaped rouletting tool was operated with the aid of an axle, then it represents a borderline case of the principle of rouletting by wheel rolling, and although a long, continuous line of roulette impressions could not have been produced by this tool, one might justifiably claim that the Hopewell Indians of Ohio were at least one-sixth of the way toward the goal of rouletting by wheel rolling.

GEORGE I. QUIMBY
Chicago Natural History Museum
Chicago, Illinois
October, 1948

"TEPEXPAN MAN," A CRITIQUE OF METHOD

On October 17, 1947, I read a paper, "A Critique of Some Archaeological Field Methods," before the Anthropology Section of the Indiana Academy of Science. The occasion was the annual meeting of the group at Ball State Teachers College, Muncie, Indiana. The paper in its entirety was accepted for publication in the *Proceedings* of the Academy. I later withdrew the paper because I did not believe this to be the proper medium for its dissemination. The *Proceedings* for 1947 has now been issued and since it contains an abstract of my paper[1] I think it proper to proceed with its publication with some minor changes.

[1] Waldo R. Wedel and Harry M. Trowbridge, "A Prehistoric Roulette from Wyandotte County, Kansas," *Proceedings of the United States National Museum*, Vol. 88, No. 3091, pp. 581–6. Washington, 1940.

[1] Glenn A. Black, "A Critique of Some Archaeological Field Methods," *Proceedings of the Indiana Academy of Science for 1947*, Vol. 57, p. 16, Muncie, 1948.

As one whose primary interest is the proper recovery of archaeological material, I was much concerned when articles first appeared in periodicals of national scope announcing the discovery of "Tepexpan Man." My concern was based upon evidence of poor field technique as exhibited by photographs illustrating the articles in question.

The discovery on February 22, 1947[2] climaxed a two year search for the physical remnants of Early Man carried out by Dr. Helmut de Terra under the auspices of the Viking Fund, Inc., of New York. The site of the discovery was the dry bed of an ancient lake at Tepexpan in the State of Mexico. Here an alluvial deposit is overlaid by layers of calcium carbonate, lake sediments, and recent deposits. The lower layer involved in the discovery has been established as the "Becerra Formation," equating with a pluvial period of 8,000–10,000 years ago. Previous explorations at Tepexpan had been productive of five specimens of mammoth, two of which had been excavated by Ing. Arellano in 1946, "one in association with a small obsidian flake."[3]

These mammoth remains led to speculation on the part of de Terra that a herd of mammoths "had walked or been driven into the swampy ground and that man had somehow been involved in their extinction."[4] This speculation no doubt gave rise to press releases of an irresponsible nature. A purported scientific publication reported that "This earliest American apparently came to his end in the rush and excitement of an elephant hunt"[5] and that "his skull and bones were found buried under about three and one half feet of soil along with a great quantity of mammoth bones, tusks and teeth."[6] De Terra plainly states, however, that the nearest mammoth remains had been found "1,000 feet distant."[7]

In view of previous discoveries de Terra rightfully considered the area a fruitful locale for additional search and, with the encouragement of the Director of the Viking Fund, experimented with geophysical methods for the discovery of buried remains. This method has long been of general use by geologists and is dependent for its success upon variations in conductivity and earth density. The application of geophysical methods to field archaeology is, in itself, commendable, but that a method of discovery so advanced should have resulted in an excavation so retrogressive in character is indeed a paradox.

Two illustrations accompany de Terra's report in AMERICAN ANTIQUITY.[8] The strata through which the excavation passed are indicated by lines inked onto the print prior to production of the halftone. The uppermost stratum is labelled "Soil," the intermediate stratum is labeled "Caliche" and the lowest "Becerra." Photographic reproductions so labeled are not, in themselves, objectionable but the need for having to indicate the point of union of the three strata is inexcusable. The vertical face as revealed by the illustrations is in a deplorable condition. It shows no attempt whatever on the part of the excavator to smooth it up or to keep it vertical and true. Had this face been kept smooth the distinction in sequential soil zones would have been obvious in the photographs without the inked-in, dotted line indicators.

The working floor of the excavation, as shown in the illustrations just cited, is in worse condition than the vertical face. It is uneven; there are clods of loose earth scattered around over it; and more unforgivable than anything else, the skull reposes in a scooped-out, nest-like depression. It appears as though it had been removed and then replaced for the purpose of taking this picture. I have seen another photograph in which the top of the skull is shown, apparently *in situ*.[9]

On the basis of these photographic illustrations, I would challenge de Terra's statement that "the cut of the excavation showed no traces of intrusive burial nor any signs of subsequent disturbance."[10] As a matter of fact, I must draw attention to the possibility, even probability, that there was a pit immediately above the spot where the skull reposes. There is at least a dark area, broadly columnar in form, extending vertically through the Caliche zone and perhaps below it. This feature can be seen plainly in Plate VI, A and B in AMERICAN ANTIQUITY and it is also evident in *Life*, page 110, lower left illustration. This dark area may conceivably be due to shadows cast by irregularities in the face of the excavation. Since there is room for question, de Terra is to be criticized for allowing this condition to exist in connection with such a potentially important discovery. "The ceramic bearing strata with Aztec and older sherds lie on top of the Caliche"[11] according to de Terra. The dark area in the face seems to start at the top of the Caliche and pass downward into the Becerra. Here there are conditions which would argue for the presence of a pit extending from the upper "Soil" stratum—which contained the sherds mentioned above—down to the burial level. I am not inferring that the burial was intrusive into the Becerra. I cite the possibility only to emphasize the seriousness of not properly exposing the burial in relation to its background face and overlaying deposits.

The photograph of the skull must have been taken before an attempt was made to expose the balance of the skeleton, or at least no other parts of it are in evidence in A, Plate VI, AMERICAN ANTIQUITY. In one illustration in *Life*,[12] showing the skull either before scooping out the "nest" or perhaps after replacing earth around it, there is what appears to be a humerus projecting from beneath the left hand of a person reclining upon the floor of the excavation.

After photographing the skull the excavation may have been enlarged, for, in B, Plate VI, AMERICAN ANTIQUITY, it appears that additional earth has been removed from

---

[2] Helmut De Terra, "Preliminary Note On the Discovery of Fossil Man at Tepexpan in the Valley of Mexico," AMERICAN ANTIQUITY, Vol. 13, No. 1, pp. 40–4, 1947.

[3] De Terra, *op. cit.*, p. 41.

[4] *Idem.*

[5] Anonymous, "Earliest American Found," *Science News Letter*, Vol. 51, No. 10, p. 158. Washington, 1947.

[6] *Idem.*

[7] De Terra, *op. cit.*, p. 41.

[8] *Ibid.*, Pl. VI, A.

[9] Anonymous, "Scientists Find Ice Age American," *Life*, Vol. 22, No. 13, p. 110. New York, 1947.

[10] De Terra, *op. cit.*, p. 41.

[11] *Idem.*

[12] *Life*, Vol. 22, No. 13, p. 110.

the far corner of the floor and vertical face. That the excavation was made no larger than necessary is suggested by shadows cast in this same illustration. If all of the photographs herein cited were taken on the same day, not much time was devoted to exposing the skeleton.

The second photograph in AMERICAN ANTIQUITY shows "the skeletal remains after removal of the skull, whose original position is indicated by the hammer."[13] Just why the skull should have been removed and its position marked by a geologist's hammer is not clarified in the text. In this picture the floor of the excavation is almost as messy as in A. A few long bones are in evidence, some with the joints broken off. The three strata are again indicated by inked-in lines on the print and again there is no evidence of an attempt to clean up the vertical face.

The text states that the bones were "in a wet, silty clay and some of them were broken in the excavation and during the drying and cleaning process in the laboratory."[14] This is a matter of great regret and must have resulted from carelessness.

So far as the actual excavation is concerned, it seems to me that it has been horribly handled. If de Terra and his colleagues have pioneered in the use of geophysical techniques in archaeology, they are to be commended. They are also to be criticized for not applying digging methods of equal merit. One has only to scan the illustrations of a few modern archaeological reports to note that most explorations are not now the mussy affairs that they were some few years ago. In any phase of scientific research precision and tidiness are assets. This is especially true of a discovery of such potential importance as "Fossil Man"—a creature that has been searched for by so many for so long. From evidence at hand it is going to be difficult for de Terra to satisfy the justifiably critical that his discovery should be accorded the antiquity that the geological matrix in which it was buried might otherwise warrant.

This expedition was utilizing a method of sub-surface exploration whereby something of importance might be located prior to actual digging activity. It seems to me, therefore, that when the "spot of high electrical resistance" was noted upon the instrument being used, and its position plotted upon the contour map, all elements of surprise were removed. This being so, the actual approach to the cause of instrument reaction should have been made cautiously and methodically. A large area, square or rectangular, should have been cleared off and the horizontal surface thus exposed carefully smoothed by troweling. Such a procedure, if repeated to a sufficient depth to pass below any recent disturbances, would preclude doubt as to whether or not there was an intrusive grave pit involved.

After proceeding in this manner until the layer productive of "Aztec and older sherds"[15] had been passed, it would have been wise to have divided the horizontal working floor in half directly above the point of indicated deposit, and to have excavated one-half of the area to a depth sufficient to expose the material, leaving the other half until later. Application of this technique, if the vertical face and the horizontal floor had been kept clean and smooth, would have provided all who viewed the actual site, or photographs of the excavation, a realization that the human remains were actually below the three or more soil deposits as stated in the text. When you look at a photograph of a vertical face which is *smooth* and *clean*, and across that face there extends, *unbroken*, strata of soils which are distinctive in character, there can be no question as to the priority of inhumation over deposit of soil layers. I will concede that some soil varieties lack individual, visual character, but the case in point is not an instance. The upper "Soil," intermediate "Caliche," and lower "Becerra" would have enough individuality to have registered plainly upon good panchromatic film, properly exposed.

After exposure of part of the skeleton in relation to the profiles above it, the balance of the block should have been removed and the *entire* skeleton exposed, *in situ*. All of the bones should have been freed of their earth matrix and left as found until photographed. Under no circumstances should the skull have been exposed by scooping out the soil around it. Nor should the skull have been removed and its place usurped by a "hammer" for purposes of showing its original relation to the balance of the skeletal remains.

After spending over a year in search where can the excuse for haste be found after the discovery was made? I hope that de Terra may find other examples of what may be very early man but when and if such discoveries are made, excavating methods as advanced as his geophysical divining rod should be the means of properly exposing them to the critical eye of all who are interested in his work and his quest.

GLENN A. BLACK
The Indiana Historical Society
Indianapolis, Indiana
January, 1949

---

[13] De Terra, *op. cit.*, Pl. VI, B.
[14] *Ibid.*, p. 42.
[15] *Ibid.*, p. 41.

BOOK REVIEW

Guide Book to the Ruins of Copan. GUSTAV STROMSVIK. Publications, Carnegie Institution of Washington, No. 577. Washington, 1947. 76 pp., 13 pls., 3 maps.

The average man who visits the Maya ruins of Copan today will do so by air, and he has every reason to take Mr. Stromsvik's book with him. It is small enough to fit in a jacket pocket or a handbag, and light enough to add to airplane luggage without a second thought. It is not only a completely usable guidebook, but was written by the outstanding authority on Copan, the archaeologist who spent twelve years excavating and restoring the site.

A reconstruction of Copan as seen from the air and a photograph of the Great Plaza as it is today serve as frontispiece to the book. The text starts with a description of the country where the ruins lie, in a mountain valley 2040 feet above sea level in western Honduras. This is followed by a summary of the history of the Copan area, from indications of an early pre-Maya culture down to the present day. While the valley of Copan was still well populated when the Spanish reached there in 1530 the ancient city was already in ruins.

The first European to visit these ruins was Garcia de Palacio in 1576. A translation of his description of the site is followed by an account of visits and excavations in the nineteenth century by Galindo, Stephens, Maudslay, and the Peabody Museum of Harvard, and in the twentieth by Morley, Spinden, and finally the Carnegie Institution of Washington working with the government of Honduras.

A brief explanation of stelae, altars, hieroglyphic inscriptions, and Maya chronology is followed by a short description of the monuments and buildings that the average tourist would have time to visit. Six sheets of plates averaging two photographs to a page are inserted in a block one-third of the way through the book. Three excellent maps come at the end; the first locating Copan in Central America; the second locating the ruins and the modern town in the valley of Copan; and the third describing the site. Comparison of this book with Morley's *Guide Book to the Ruins of Quirigua* (Carnegie Institution of Washington, 1935) reflects not only change in mode of tourist travel, but the current high cost of publication. Text and maps are well printed and completely legible, but the photographs are poorly reproduced and would have served a guide book better if each could have been headed in beside the relevant text.

Stromsvik's text is excellent as far as it goes. It lacks any resumé of Maya history and any attempt to relate Copan past or present to the rest of the Maya region. These may have been omitted to save space, on the assumption that anyone visiting such a site would already have that background. It is a pity, however, that modesty has kept Mr. Stromsvik from giving any account of the magnificent job done at Copan by the Carnegie Institution from 1934 to 1946. Its history, with the mechanics involved involved in excavation and restoration, would add greatly to the background of the average visitor and is unobtainable elsewhere. A brief mention of changing the course of the Copan River does appear buried in a description of the Acropolis, but there is not even a reference to such things as the system devised for holding the restored stelae erect or the importation of Bermuda grass to keep the plazas clear of jungle growth. These are items as fascinating to the layman as to the professional.

One thing that should also be mentioned is the excellent example Mr. Stromsvik and his North American and Honduranean colleagues have given us of a Pan-American project successful on all social levels.

MARY BUTLER
University Museum
Philadelphia, Pennsylvania

NOTES AND NEWS

SOUTHWEST

Edward B. Danson has been appointed Assistant Professor of Anthropology, University of Colorado, Boulder, Colorado, to replace Robert H. Lister. Mr. Lister is now ranching at Watrous, New Mexico, and will teach part-time at Highlands University, Las Vegas, New Mexico. Robert Burgh has retired from the Colorado University Museum due to ill health. (*Omer C. Stewart.*)

SOUTH AMERICA

The 1948 Annual Meeting of the Institute of Andean Research was held at Viking Fund on Friday, December 17 at 4:00 p.m. Those present were Drs. A. V. Kidder, Chairman, W. D. Strong, W. C. Bennett, G. F. Ekholm, Secretary, H. Tschopik, J. B. Bird, A. L. Kroeber, and Alfred Kidder II.

Routine business considerations, including the Palenque Project and the exportation of specified archaeological collections, were discussed. Dr. J. A. Mason was elected a member of the Institute. The present officers of the Institute as of the year 1948 were unanimously re-elected and the several existing committees were left as they were. (*G.R.W.*)

SOME RECENT PUBLICATIONS

Because of the length of the Missouri Basin symposium, it has been necessary to omit the list of recent publications customarily published in the April issue of AMERICAN ANTIQUITY. This list will appear in the July issue (Vol. XV, No. 1) instead. (*Editor.*)

SOCIETY FOR AMERICAN ARCHAEOLOGY MEMBERSHIP

1948–49*

ACTIVE MEMBERS

ADAMS, RICHARD, Box 345, Lenexa, Kansas
ADAMS, RICHARD N., 2684 Yale Station, New Haven, Connecticut
ADAMS, WILLIAM RICHARD, R.R. #3, Bloomington, Indiana
ADAMS, WILLIAM Y., Window Rock, Arizona
ADEN, ROBERT CLARK, 201 Grove Blvd., Paris, Tennessee
ADIS-CASTRO, ELIAS, Dept. of Anthropology, Indiana University, Bloomington, Indiana
AGUILAR, P., CARLOS H., Apartado 99, Cartago, Costa Rica, C.A.
ALDRIDGE, C. CLAY, 206 Fairview Rd., Clarks Green, Pennsylvania
ALEXANDER, H. G., University of New Mexico, Albuquerque, New Mexico
ALLEE, MARY N., Dept. of Anthropology, University of Chicago, Chicago 37, Illinois
ALLEN, HUGH S., 2307 Cedar St., Bakersfield, California
ALLYN, HARRIETT M., Mount Holyoke College, South Hadley, Massachusetts
ANDERSON, ALMA, 736 S. Forest, Ann Arbor, Michigan
ANDERSON, FRANK G., Dept. of Sociology, Washington State College, Pullman, Washington
ANDERSON, LEO O., Van Buren, Missouri
ANDREWS, E. WYLLYS, Waterside Drive, Washington 9, D.C.
ANTEVS, ERNST, The Corral, Globe, Arizona
ANTLE, H. R., Box 1527, Bartlesville, Oklahoma
APPELL, GEORGE N., R.D. 5, York, Pennsylvania
ARENSBERG, WALTER C., 7065 Hillside Ave., Hollywood 28, California
ARNOLD, BRIGHAM A., 1441 E. 5th St., Tucson, Arizona
ARNOLD, WAYNE S., 19 Stanwix St., Albany, New York

BABBITT, J. R., 519 N. Leroux St., Flagstaff, Arizona
BABY, RAYMOND S., Ohio State Museum, Columbus 10, Ohio
BACHENHEIMER, RICHARD, 2520 Channing, Berkeley, California
BAERREIS, DAVID A., Dept. of Sociology & Anthropology, University of Wisconsin, Madison 6, Wisconsin
BAGGERLY, CARMEN, Route 2, Imlay City, Michigan
BAHTI, THOMAS NEIL, University of New Mexico, Box 94, Albuquerque, New Mexico
BAILEY, WILFRID C., Dept. of Anthropology, University of Texas, Austin 12, Texas
BAIRD, J. HENRY, Alpine Villa, Pleasant Grove, Utah
BAKER, WILLIAM E., Box 366, Boise City, Oklahoma
BALDWIN, GORDON C., National Park Service, 307 Federal Bldg., Omaha 2, Nebraska
BARNETT, H. FRANK, 206 E. St. Cloud Rd., San Antonio, Texas
BARTLETT, KATHERINE, Box 601, Museum of Northern Arizona, Flagstaff, Arizona
BAUMHOFF, MARTIN A., 2659 Lombard St., San Francisco 23, California
BAUXAR, J. JOE, 1022 West Boyd, Norman, Oklahoma
BEALS, DR. RALPH L., Dept. of Anthropology and Sociology, University of California, Los Angeles, California
BEARD, E. S., Covelo, California
BEARD, ROLAND E., 1507 E. Stayton, Victoria, Texas
BEARDSLEY, DR. RICHARD K., Dept. of Anthropology, Univ. of Michigan, Ann Arbor, Michigan
BELL, ROBERT E., 531 N. Main St., P.O. Box 229, Marion, Ohio
BENEDETTO, FIORE, Via Rubiana 27, Torino, Italy
BENEWAY, ALMON B., Vassar View Rd., Poughkeepsie, New York
BENNETT, JOHN W., Dept. of Sociology, Ohio State University, Commerce Bldg., Columbus 10, Ohio
BENNETT, DR. WENDELL C., 55 Hillhouse Ave., New Haven 11, Connecticut
BENNYHOFF, JAMES ALLAN, Box 963, Quincy, California
BERLIN, HEINRICH, Apartado 1879, Mexico, D.F.
BERNAL, IGNACIO, Chopo No. 5, Mexico, D.F.
BERNE, ALBERT, Box 458, Madeira, Ohio
BIRD, DR. JUNIUS, American Museum of Natural History, Central Park W. at 79th St., New York 24, New York
BIRDSELL, JOHN C., 617 W. Washington St., South Bend, Indiana
BIRDSELL, JOSEPH B., Department of Anthropology and Sociology, University of California, Los Angeles, California
BITTIKER, DR. VIRGIL A., Box 264, Hardin, Missouri
BLACK, GLENN A., R.R. #3, Newburgh, Indiana
BLAKE, LEONARD W., 6014 Westminster Pl., St. Louis 12, Missouri
BLAKER, MRS. C. B., Div. of Archaeology, U.S. National Museum, Washington 25, D.C.
†BLISS, ROBERT WOODS, 1537 Twenty Eighth St., Georgetown, Washington 7, D.C.
BLISS, WESLEY L., Laboratory of Anthropology, Love Memorial Library, University of Nebraska, Lincoln, Nebraska
BLUHM, ELAINE, 400 S. Blackstone Ave., La Grange, Illinois
BOOHER, ROBERT E., 4119 11th Ave., N.E., Seattle 5, Washington
DE LA BORBOLLA, DANIEL F. RUBIN, Director de la Escuela Nacional de Antropologia, Moneda 13, Mexico D.F., Mexico
BOURNE, JOHN A., 1850 Lombard Rd., San Marino, California
BOWER, PRISCILLA C., 1625 Quince St., Denver 7, Colorado
BRAGA, GEORGE A., 106 Wall St., New York 5, New York
BRAINERD, GEORGE W., The Southwest Museum, Highland Park, Los Angeles 42, California
BREW, J. O., Peabody Museum, Cambridge 38, Massachusetts
BROSIUS, DR. W. L., 2349 Leslie Ave., Detroit 6, Michigan
BROWN, JOHN C., III, c/o R.D. #2, Southbridge, Massachusetts
BROWN, MELANIE B., 5646 Kingsbury Ave., St. Louis 12, Missouri
BRUCE, ALICE, Box 231, Island Heights, New Jersey
BULGER, HAROLD A., Barnes Hospital, 600 S. Kings Highway, St. Louis, Missouri
BULL, NORRIS L., 106 Hawks Nest Beach, Old Lyme, Connecticut
BULLBROOK, J. A., c/o Post Office, Palo Seco, Trinidad, British West Indies
BULLEN, RIPLEY P., Florida State Museum, Gainesville, Florida
BURCAW, ELLIS, Brewster, Ohio
BURGH, ROBERT F., University Museum, Boulder, Colorado
BURNETT, E. K., Museum of the American Indian, Heye Foundation, Broadway at 155th St., New York, New York
BURROUGHS, CARROLL A., Department of Anthropology, University of Washington, Seattle 5, Washington
BUTLER, CHARLES T., 2140 Calder Ave., Beaumont, Texas
†BYERS, DOUGLAS S., Phillips St., Andover, Massachusets

CALDWELL, JOSEPH R., U.S. National Museum, Division of Archaeology, Washington 25, D.C.
CALLEN, MARY LOUISE, 1001 2nd West, McCook, Nebraska
CAMPBELL, DR. NANCY D., Coronado Bldg., Santa Fe, New Mexico
CAMPBELL, THOMAS N., 2900 Kerbey Lane, Austin 21, Texas
†CAMPBELL, MRS. WM. H., Box 116, Kings Canyon Rd., Carson City, Nevada
CAPPS, HUGH O. JR., 410 Cottonwood Ave., Las Animas, Colorado
CARDOSO, SR. VICTOR A., Rioja 286, Buenos Aires, Argentina
CAREY, HENRY A., Moorehead State College, Moorehead, Kentucky
CARPENTER, EDMUND S., 4029 Glendale St., Philadelphia, Pennsylvania
CARPENTER, EDWIN H., 5261 Coliseum St., Los Angeles 16, California
CARR, ARTHUR B., 1927 N. New Jersey St., Indianapolis 2, Indiana
CASO, DR. ALFONSO, Moneda 16, Mexico D.F., Mexico
CARTER, GEORGE F., The Johns Hopkins University, Baltimore 18, Maryland
CASE, MRS. JOHN M., Sheridan County, Big Horn, Wyoming
CAWSE-MORGON, CAPT. NORMAN E., 710 Fair Ave., San Antonio, Texas
CAYWOOD, LOUIS R., P.O. Box 186, Vancouver, Washington
CENTER, BENJAMIN H., 988 South Remington Rd., Columbus 9, Ohio
CHAMPE, JOHN L., 1917 So. 27th St., Lincoln, Nebraska
CHAPMAN, CARL H., 15 Switzler Hall, University of Missouri, Columbia, Missouri
CHAPMAN, E. M., Moundville State Monument, Moundville, Alabama

---

* List as of January 19, 1949.
† Life Member.

CHAPMAN, KENNETH M., Laboratory of Anthropology, Santa Fe, New Mexico
CHARD, CHESTER, Department of Anthropology, University of California, Berkeley, California
CHIDSEY, BARBARA DUNN, 4241 University Station, Tucson, Arizona
CHOWNING, FRANK E., 2110 Country Club Lane, Little Rock, Arkansas
CLAFLIN, W. H., JR., Room 1006, 75 Federal St., Boston 10, Massachusetts
CLARK, JAMES L., JR., 536 Birch Ave., Westfield, New Jersey
CLARK, MRS. J. TATE, c/o Phillips Petroleum Co., Jackson, Mississippi
CLARKE, MRS. ALDEN c/o Howson, Newtown, Connecticut
CLAUSER, CHARLES E., No. 1 Briar Rd., Muncie, Indiana
CLEMENTS, GEO. P., 4805 Alta Canaydard, La Canada, California
COALE, GEORGE L., 5655 Woodman Ave., Van Nuys, California
COATES, JAMES R., 515 Pennsylvania Ave., Norfolk 8, Virginia
CODY, PATRICIA, 3064 Sacramento St., San Francisco 15, California
COE, JOFFRE L., Box 561, Chapel Hill, North Carolina
COFFIN, CLAUDE C., P.O. Box 444, Fort Collins, Colorado
COFFIN, ROY G., Colorado State College, Fort Collins, Colorado
COLE, DR. FAY-COOPER, 3229 Calle Cedro, Santa Barbara, California
COLLIER, CHARLES A., Box 1719, Atlanta 1, Georgia
COLLIER, DONALD, Chicago Natural History Museum, Chicago 5, Illinois
COLLINS, HENRY B., JR., Bureau of American Ethnology, Washington 25, D.C.
COLLINS, KISS, 757 Westchester, Grosse Pointe 30, Michigan
COLTON, DR. HAROLD S., Box 601, Museum of Northern Arizona, Flagstaff, Arizona
CONGDON, DR. WM. J., 611 Prince Henry Ave., Hopewell, Virginia
COOPER, DR. JOHN M., Catholic University of America, Washington 17, D.C.
COOPER, PAUL, P.O. Box 1984, Lincoln 1, Nebraska
CORBETT, JOHN M., 1517 Delmont Lane, Takoma Park, Maryland
CORDY, N., 548 E. Avenue 39, Los Angeles 31, California
COSGROVE, HARRIET S., Peabody Museum, Cambridge 38, Massachusetts
COTTER, C. S., Golden Spring, Limehall, Jamaica
COTTER, J. L., Natchez Trace Parkway, Box 428, Tupelo, Mississippi
COURVILLE, DR. CYRIL B., 1801 New Jersey St., Los Angeles 33, California
COY, EDNA, Route 3, Box 306, Amarillo, Texas
CRAFT, CAROL CHARLENE, University of Alaska, College, Alaska
CRESSMAN, DR. L. S., University of Oregon, Eugene, Oregon
CRICK, J. M., Corder, Missouri
CRUXENT, PROF. J. M., Sociedad a Traposos, Altos Of. 24, Caracas, Venezuela
CUMMINGS, DR. BYRON, Rt. 8, Box 549, Tucson, Arizona
CUMMINGS, MRS. MARIAN E., Round Hill, Greenwich, Connecticut
CUNNINGHAM, WILBUR M., 401 Maple St., Benton Harbor, Michigan
CURTIS, KARL P., P.O. Box 524, Gamboa, Canal Zone, Panama

DAHMS, HAROLD F., Box 166, Seward, Nebraska
DANIELS, MRS. HELEN S., Box 1468, Durango, Colorado
DANSON, EDWARD B., 601 Baseline Rd., Boulder, Colorado
DARLING, H. J., 10033 116th St., Edmonton, Alberta, Canada
DAVIDSON, D. S , c/o Department of Anthropology, University of Washington, Seattle, Washington
DAVIDSON, RICHARD B., 11101 Rose Ave., Los Angeles 34, California
DAVIS, E. MOTT, JR., University of Nebraska State Museum, Morrill Hall, Lincoln 8, Nebraska
DAVIS, H. E., Hotel Pawnee, North Platte, Nebraska
DAVIS, HARRY T., North Carolina State Museum, Raleigh, North Carolina
DAWSON, TERRY, 1213 Tyler St., St. Louis 6, Missouri
DEAN, LESLIE V., Hollister, Idaho
DE BOVRIE M., SR. ING. E., Calle Jose Joaquin, Perez 2, Ciudad Trujillo, Dominican Republic
DEEVEY, EDWARD S., JR., Osborn Zoological Laboratory, Yale University, New Haven 11, Connecticut
DE JARNETTE, DAVID L., Curator, Alabama Museum of Natural History, University, Alabama
DE LAGUNA, FREDERICA, 221 Roberts Rd., Bryn Mawr, Pennsylvania
DELAVAN, WAYNE, R.R.# 2, Box 61, Bronson, Kansas
DELKS, PATRICIA J., 31 N. Bolton Ave., Indianapolis 1, Indiana
DELLINGER, DR. S. C., University of Arkansas, Fayetteville, Arkansas
DE LONG, PATRICIA, 536 Lincoln Ave., Palo Alto, California
DENLINGER, ELMER L., 1027 Strong Ave., Elkhart, Indiana
DETTRA, JOHN W., 611 Penn St., Yeadon, Pennsylvania
DEUEL, DR. THORNE, Director, Illinois State Museum, Springfield, Illinois
DICK, HERBERT W., 340 Harvard St., Cambridge 39, Massachusetts
DISINGER, FOSTER, 126 Front St., Binghamton, New York
DIXON, KEITH A., 247 W. Walnut St., Monrovia, California
DOBYNS, HENRY F., General Delivery, Niles, California
DODGE, V. K., 137 Bell Court West, Lexington, Kentucky
DOERSCHUK, HERBERT M., Box 505, Badin, North Carolina
DOUGLAS, FREDERIC H., 1300 Logan St., Denver, Colorado
DOUGLASS, JAMES E., Box 53, Monticello, Utah
DRAGOO, DON W., R.R. #2, Franklin, Indiana
DRAKE, ROBERT J., 115 N. University, Albuquerque, New Mexico
DRUCKER, LT. CMDR. PHILIP, USNR, Commander, Naval Forces Marianas, Box 22, Fleet Post Office, San Francisco, California
DUFFEN, WILLIAM A., 4026 E. Justin Lane, Frontier Village, Tucson, Arizona
DUPOUY, WALTER, Apartado 328, Caracas, Venezuela
DUTTON, BERTHA P., Museum of New Mexico, Box 1704, Santa Fe, New Mexico
DYSON, ROBERT H., JR., 303 Riverside Drive, Toronto, Ontario, Canada

EBERHARDT, HENRY J., Box 244, Chester, New Jersey
EDMUNDSEN, W. T., 1125 S. 7th, Hood River, Oregon
EFNOR, HENRY E., 730 E. 7th St., N., Newton, Iowa
EICHENBERGER, J. ALLEN, 523A N. Fifth St., Hannibal, Missouri
EIKER, JOHN S., Fairfield, Pennsylvania
EISELEY, LOREN C., Department of Anthropology, Bennett Hall, University of Pennsylvania, Philadelphia 4, Pennsylvania
EKBLAW, DR. W. ELMER, Clark University, Worcester 3, Massachusetts
EKHOLM, GORDON F., American Museum of Natural History, Central Park West at 79th St., New York 24, New York
ENGERRAND, GEORGE C., Department of Anthropology, University of Texas, Austin, Texas
ENGLAND, W. J., Route 4, Caro, Michigan
ENSTAD, MRS. C. J., 609 Shelton St., Dallas, Oregon
ERICKSON, ERNEST, 230 Park Ave., New York 17, New York
ERWIN, HENRY P., 723 15th St., N.W., Washington 5, D.C.
ESBENSHADE, MRS. JOHN W., 1357 Bryant St., Pasadena, California
ESCH, LYND J., 4051 Otterbein Ave., Indianapolis 3, Indiana
EVANS, MRS. GERTRUDE S., 350 South Main St., Freeport, New York
EVANS, WILLIAM S. JR., 390 MacArthur Blvd., Oakland 10, California
EWALD, PAUL A., 314 3rd St., Apt. 1, Bismarck, North Dakota
EZELL, PAUL H., RT. 4, Box 23, Tucson, Arizona

FAIRBANKS, CHAS. H., 1019 Harmick Ct., Willow Run Village, Michigan
FALKENBACH, CHARLES H., American Museum of Natural History, 77th St. and 8th Ave., New York 24, New York
FARMER, MALCOLM F., San Diego Museum of Man, Balboa Park, San Diego, California
FARVER, S. S., 37 N. Railroad St., Palmyra, Pennsylvania
FAY, GEORGE E., 1305 Crest Drive, Joplin, Missouri
FEJOS, DR. PAUL, 14 E. 71st St., The Viking Fund, Inc., New York 21, New York
FELLER, BARBARA, 370 Temple St., New Haven, Connecticut
FENENGA, FRANKLIN, Department of Anthropology, University of California, Berkeley, California
FENTON, DR. WILLIAM N., Bureau of American Ethnology, Washington 25, D.C.
FERGUSON, MRS. ALICE L. L., 2330 California St., N.W., Washington 8, D.C.
FERGUSON, THOMAS STUART, 1305 Franklin St., Oakland 12, California
FILLMAN, MARGARET, 16857 Baylis, Detroit 21, Michigan
FINKLE, JOAN E., Social Science Research Center, University of Puerto Rico, Rio Piedras, Puerto Rico
FINLEY, O. M., 1930 Ave. C, Scottsbluff, Nebraska
FISHER, KURT A., P.O. Box 23, Port Au Prince, Haiti
FLEMING, MRS. THOMAS JR., 1541 Lombardy Rd., Pasadena, California
FORD, JAMES A., Department of Anthropology, American Museum of Natural History, Central Park West at 79th St., New York, New York
FOSTER, JAMES R., University of Maryland, Department of Entomology, College Park, Maryland
FOWLER, MELVIN L., 1006 East 62nd, Chicago 37, Illinois
FOWLER, WILLIAM S., 42 Huntington Dr., Rumford, Rhode Island

Franke, Walter E., 198 East St., North Attleboro, Massachusetts
Frankforter, Weldon D., Assistant Curator of Paleontology, University of Nebraska State Museum, Lincoln 8, Nebraska
Franz, Harvey, 1027 Ogden Ave., Benton Harbor, Michigan
Fraser, Dorothy E., 3433 90th St., Apt. F63, Jackson Heights, New York
Frederickson, David A., 2308 Cheshire Way, Redwood City 1, California
French, W. C., 1018 West St., Grinnell, Iowa
Frohlin, John, P.O. Box 374, Pluckemin, New Jersey
†Fulton, W. S., Dragoon, Arizona

Gabel, Norman E., Department of Social Science, Santa Barbara College, Santa Barbara, California
Garner, James C., Department of Anthropology, University of New Mexico, Albuquerque, New Mexico
Garrett, Kenton, P.O. Box 127, Lansing, Kansas
Garth, Thomas R. Jr., 1201 Dell Ave., Walla Walla, Washington
Gayton, Dr. Anna N., P.O. Box 880, Santa Cruz, California
Gebhard, David S., 5032 S. Morgan Ave., Minneapolis 19, Minnesota
Gebhard, Paul H., Department of Zoology, Indiana University, Bloomington, Indiana
Gessner, George N., 11 Adams St., Dansville, New York
Getty, Harry T., Arizona State Museum, Tucson, Arizona
Giddings, Prof. James L., Jr., University of Alaska, College, Alaska
Gifford, E. W., Anthropology Museum, University of California, Berkeley 4, California
Gifford, Stanley, Fort Ticonderoga Military Museum, Fort Ticonderoga, New York
Gilkyson, Mrs. Phoebe H., Montgomery County, Mont Clare, Pennsylvania
Gillette, Charles E., 1203 E. 58th St., Chicago 37, Illinois
Ginnane, E. S., 1513 13th Place, Birmingham, Alabama
Gladwin, Dr. Harold S., P.O. Box 540, Santa Barbara, California
Goddard, Charles F., Mattituck, Long Island, New York
Goff, Dr. C. W., 30 Farmington Ave., Hartford, Connecticut
Goggin, John M., Department of Sociology and Anthropology, University of Florida, Gainesville, Florida
Goins, John F., 2801 Sylhowe Rd., Oakland 2, California
Goodell, Mrs. Helen, Box 172, College, Alaska
Goslin, Robert M., 316 Wilson Ave., Columbus 5, Ohio
Grauer, Ben, 1 W. 67th St., New York 23, New York
Green, Amos R., R.R. 1, Eau Claire, Michigan
Greengo, Robert E., 2034 Ashby Ave., Berkeley 3, California
Greenman, Dr. Emerson F., University Museums Bldg., Ann Arbor, Michigan
Griffin, James B., University Museums Bldg., Ann Arbor, Michigan
Griffin, John W., Room 103, Seagle Bldg., Gainesville, Florida
Griggs, Everett, Abington, Connecticut
Groffman, Charles C., Route 4, Box 747 CF, Albuquerque, New Mexico
Gross, L. S., 3828 Livingston St., N.W., Washington 15, D.C.
Guernsey, E. Y., Box 1294, Cocoa, Florida
Gunnerson, James H., Apt. E. 2348 O St., Lincoln, Nebraska
Gunnison, Lawrence A., R.F.D. 1, Sanborn, New York
Gunther, Hugo R., 1194 Cook Ave., Lakewood, Ohio
Guthe, Alfred K., Museum of Anthropology, University Museums Bldg., University of Michigan, Ann Arbor, Michigan
Guthe, Dr. Carl E., New York State Museum, State Education Department, Albany 1, New York
Guthrie, Mrs. Georgiana R., 10970 Ohio Ave., Los Angeles 24, California

Haag, Wm. G., Museum of Anthropology, University of Kentucky, Lexington, Kentucky
Hadlock, Wendell S., Water St., Ellsworth, Maine
Hagen, Richard S., 5427 Blackstone Ave., Chicago 15, Illinois
Hall, Will L., 6244 Oakland Ave., St. Louis 10, Missouri
Hallett, Leaman F., 31 West St., Mansfield, Massachusetts
Halseth, Odd S., 4619 E. Washington, Phoenix, Arizona
Hamilton, Henry W., 787 Eastwood, Marshall, Missouri
Hammel, Eugene A., 2336 College Ave., Berkeley 4, California
Hanley, Mrs. Violet K., 1915 Geddes Ave., Ann Arbor, Michigan
Hard, Robert A., 15054 Co. Line Rd., Fenton, Michigan
Hardies, Roderick R., 629 Second St., S.E., Puyallup, Washington
Harp, Elmer Jr., Dartmouth College Museum, Hanover, New Hampshire
Harrington, J. C., 4114 Hanover Ave., Richmond 21, Virginia
Harrington, M. R., The Southwest Museum, Highland Park, Los Angeles 42, California
Harris, Alfred II, c/o Department of Anthropology, University of Chicago, Chicago 37, Illinois
Harris, Alta Mae, Rockefeller Hall, Bryn Mawr College, Bryn Mawr, Pennsylvania
Harris, R. K., 9024 San Fernando Way, Dallas 18, Texas
Harrold, Dr. C. C., 700 Spring St., Macon, Georgia
Hart, George E., Wading River, Long Island, New York
Haury, Emil W., Department of Anthropology, University of Arizona, Tucson, Arizona
Hawkins, Jane, 216 South Ingalls, Ann Arbor, Michigan
Hawley, F. G., 1624 East 5th. St., Tucson, Arizona
Hedgecoke, E. V., Box 11, Stinnett, Texas
Heggland, Stanley E. Jr., 303 Hillside, Glen Ellyn, Illinois
Heizer, Robert F., Department of Anthropology, University of California, Berkeley 4, California
Helmen, Vernon, 208 Murray St., South Bend 17, Indiana
Hencken, H. O'Neill, Peabody Museum, Harvard University, Cambridge 38, Massachusetts
Hendry, J. R., 17520 Roselawn Ave., Detroit 21, Michigan
Hermitte, Sra. Esther, Canning 2470, 5 Piso Dto. J, Buenos Aires, Argentina
Herskovits, Dr. M. J., Northwestern University, Evanston, Illinois
Hewen, Loring M., 51 East 42nd St., New York 17, New York
Hewes, Gordon W., Box 165, University Station, Grand Forks, North Dakota
Hibben, Frank C., 3005 Campus Blvd., Albuquerque, New Mexico
Higgs, Charles D., Fontana, Wisconsin
Hill, A. T., P.O. Box 100, Capitol Bldg., Lincoln 9, Nebraska
Hill, Ernest Jr., 4031 East Anderson, Albuquerque, New Mexico
Hill, Gertrude, 830 Santa Paula St., Santa Paula, California
Hill, W. W., Department of Anthropology, University of New Mexico, Albuquerque, New Mexico
Hodge, F. W., Director, The Southwest Museum, Highland Park, Los Angeles 42, California
Hodges, Dr. T. L., Bismarck, Arkansas
Holland, C. J., Kent Rd., Charlottesville, Virginia
Holmquist, Carl E., 441 Parkdale Ave., Royal Oak, Michigan
Hornblower, Ralph, Jr., No. 5 Ives Rd., Hewleds, Long Island, New York
†Hornblower, Henry, II, 7 Louisburg Square, Boston, Massachusetts
Householder, J. C., 5043 Primrose Ave., Indianapolis, Indiana
Howard, George D., 144-76 Village Rd., Apt. C, Jamaica, New York
Howard, Lynn E., Museum of Anthropology, University of Michigan, Ann Arbor, Michigan
Howard, Robert R., 503 South 6th E., Missoula, Montana
Howe, Bruce, 1821 H St., N.W., Washington 6, D.C.
Howe, J. V., Jeffres, Virginia
†Howells, Dr. W. W., Stirling Hall, Madison 6, Wisconsin
Hubbard, Lee, 725 South Ross St., Santa Ana, California
Hucksoll, Mrs. Lawrence L., 2100 Clineay, Norwood 12, Ohio
Hughes, Jack T., 441 South 50th, Lincoln, Nebraska
Hulburt, Milton F., Lockbox No. 35, Reedsburg, Wisconsin
Hulse, Frederick S., c/o Department of Anthropology, University of Washington, Seattle 1, Washington
Hunt, Mrs. Charles B., 635 Vine St., Denver 6, Colorado
Hurst, C. T., Western State College, Gunnison, Colorado
Hurt, Wesley R., Department of Anthropology, University of Michigan, Ann Arbor, Michigan

Irvine, Sam C., Marshall, Missouri
Ives, Ronald L., 32 Laurel St., Upper Mont Clair, New Jersey

Jackson, George, R.F.D. 1, Sandy Hook, Connecticut
Jakeman, M. Wells, Brigham Young University, Provost, Utah
Jenkins, Virginia Wyckoff, 3 Harriett Court, Seacliff, Long Island, New York
Jennings, J. D., Department of Anthropology, University of Utah, Salt Lake City, Utah
Jensen, Dorothy Cross, Fallsington, Pennsylvania
Jerrard, L. P., 522 Willow Ave., Winnetka, Illinois

JIJON Y CAMAANO, JACINTO, Apartado 187, Quito, Ecuador
JOHNSON, FREDERICK, R. S., Peabody Foundation, Phillips Academy, Andover, Massachusetts
JOHNSON, LESLIE R., 90 East Orchard St., Allandale, New Jersey
JOHNSTON, RUSSELL A., Helmsdale P.O., Alberta, Canada
JONES, HOWARD A., 70 Greenwood Ave., Greenwood, Massachusetts
JONES, PHILIP L., 404 Miners Bank Bldg., Joplin, Missouri
JONES, VOLNEY H., Museums Bldg., Ann Arbor, Michigan
JONES, DR. WALTER B., DIRECTOR, Alabama Museum of Natural History, University, Alabama
JOYNT, JOHN W., 4159 Flora Place, St. Louis 10, Missouri
JUDD, NEIL M., U.S. National Museum, Washington 25, D.C.
JUDSON, DR. LYMAN, P.O. Box 667, Washington, D.C.
JURY, WILFRID, University of Western Ontario, London, Ontario, Canada

KAMPERMAN, DR. GEORGE, 79 Longfellow Ave., Detroit, Michigan
KAPLAN, BERNICE, 105 West 72nd St., New York 23, New York
KASTNER, DR. A. L., 1810 West Wisconsin Ave., Apt. 308, Milwaukee 3, Wisconsin
KAUFMAN, LOUIS, 835 Westholm Ave., West Los Angeles 24, California
KAUFFMAN, CHARLES F., 826 Florida Ave., York, Pennsylvania
KAVANAUGH, DR. CHARLES M., 190 North Upper St., Lexington 15, Kentucky
KEHN, GRACE E., 13 Prospect St., Williston Park, New York
KEITH, MRS. E. GORDON, 409 Conshohocken State Rd., Bala Cynwyd, Pennsylvania
KELEMEN, PAL, Norfolk, Connecticut
KELLAR, JAMES, 400 Webster Ave., Plymouth, Indiana
KELLEY, DAVID H., Adams I 42, Cambridge 38, Massachusetts
KELLEY, J. CHARLES, University of Texas, Austin 12, Texas
KELLY, DR. ISABEL, Reforma 34, Mexico D.F., Mexico
KELLY, MARY F., Department of Geology, University of Kentucky, Lexington 29, Kentucky
KELLY, W. H., Chebeague Island, Maine
KEMPTON, DR. ROCKWELL M., 333 South Jefferson Ave., Saginaw, Michigan
KENT, KATE P., Valley School, P.O. Box 376, Ligonier, Pennsylvania
KERCHER, ROBERT A., 328 Witte St., Lancaster, Ohio
KEUR, DOROTHY L., 2475 Palisade Ave., Spuyten Duyvil, New York 63, New York
KEYES, DR. CHARLES R., 323 10th Ave. S., Mount Vernon, Iowa
KIDD, KENNETH E., 100 Queens Park, Toronto, Ontario, Canada
KIDDER, A. V., 10 Frisbie Place, Cambridge 38, Massachusetts
KIDDER, ALFRED, II, Peabody Museum, Cambridge 38, Massachusetts
KING, ARDEN, Middle American Research Institute, Tulane University, New Orleans 18, Louisiana
KINGMAN, MRS. EUGENE, 312 South 56th St., Omaha 3, Nebraska
KINGSBURY, DR. ISAAC W., 26 Northmoor Rd., Hartford 5, Connecticut
KINGSTON, KIRK K., 513 Annedie Rd., Baltimore 12, Maryland
KINSEY, W. HARLAND, 463 Irvington St., Daly City, California
KIVETT, MARVIN F., 2139 South 39th St., Lincoln, Nebraska
KLUCKHOHN, CLYDE, Peabody Museum, Cambridge 38, Massachusetts
KNAPP, HELEN K., Box 421, Moses Lake, Washington
KNEBERG, MADELINE C., West Strong Hall, University of Tennessee, Knoxville, Tennessee
KNECHTEL, FRITZ, Hanover, Ontario, Canada
KNOLL, CHARLES M., 120 Coolidge Ave., Spencerport, New York
KNOWLES, NATHANIEL, JR, 208 Fleming St., Hanover, Pennsylvania
KNOX, MRS. MERTICE M. C. BUCK, Box 17, Kelvin, Arizona
†KRAFT, J. L., 400 Rush St., Chicago, Illinois
KRETSCHMER, EDWIN E., 5821 West Walton St., Chicago, Illinois
KRIEGER, ALEX D., Department of Anthropology, University of Texas, Austin 12, Texas
KROEBER, DR. A. L., University of California, Berkeley 4, California
KROHN, ERNST C., 3806 Juniata St., St. Louis 16, Missouri

LAIRD, OTHO R., Nashua, Iowa
LAMBERT, MARSHALL E., Carter County Geological Society, Box 415, Ekalaka, Montana
LANE, ROBERT B., 5416 20th Ave. N.E., Seattle 5, Washington
LANG, CHARLES H. JR., 5408 McCandless Drive, Austin, Texas
LANGFORD, PERRY, 1557 7th Ave., San Diego 1, California
LANGFORD, R. R., 303 West 4th St., North Platte, Nebraska
LARSON, LOUIS H., JR., 648 16th Ave. N., South St. Paul, Minnesota
LARUE, H. C., R.R. #1, Chariton, Iowa
LATHAM, ROY, Orient, Long Island, New York
LAUGHLIN, WM. S., c/o Peabody Museum, Harvard University, Cambridge, Massachusetts
LAUNER, PHILIP J., 40 Lawndale St., Hammond, Indiana
LEECHMAN, DOUGLAS, National Museum, Ottawa, Ontario, Canada
LEH, L. L., 3365 4th St., Boulder, Colorado
LEHMER, DONALD J., Kinderhook, New York
LEVINE, ALBERT J., Snowflake, Arizona
LEVINE, EMANUEL, 66 Beacon Ave., Jersey City 6, New Jersey
LEWIS, KEPLER, 150 N. Ontario St., Burbank, California
LEWIS, MARY BUTLER, Media, Pennsylvania
LEWIS, T. M. N., University of Tennessee, Knoxville, Tennessee
LILIEN, ROSE, 509 West 160th St., New York 32, New York
LILLY, ELI, 5807 Sunset Lane, Indianapolis 20, Indiana
LINDSLEY, GEORGE M., Tripoli, Iowa
LINNÉ, DR. SIGVALD, Ethnographical Museum, Stockholm, Sweden
LINTON, DR. RALPH, Department of Anthropology, Yale University, New Haven, Connecticut
LISTER, ROBERT, Old Trails Ranch, Watrous, New Mexico
†LLOYD, MALCOLM JR., 1930 Land Title Bldg., Philadelphia 10, Pennsylvania
LODGE, BETH, South Pittsburgh, Tennessee
LOGAN, DR. CATHERINE E., 1011 Lake St., Oak Park, Illinois
LOGAN, WILFRID D., 602 North Ann St., Columbia, Missouri
LONGDEN, GRAFTON J. JR., R.R. #3, Greencastle, Indiana
LONGYEAR, JOHN M., III, Colgate University, Hamilton, New York
LOPATIN, DR. IVAN A., University of Southern California, Los Angeles, California
LORD, WM. W., Paris Tanning Company, South Paris, Maine
LORENSON, ROBERT W., 142 East 49th St., New York 17, New York
LOTHROP, S. K., 1061 Madison Ave., New York, New York
LOUDEN, WILLARD C., Branson, Colorado
LOWIE, DR. ROBERT H., University of California, Berkeley 4, California
LUBBE, CHARLES KIMBALL, 217 Columbia Terrace, Peoria, Illinois
LUCAS, VIRGINIA CUMMING, 2517 Pacific Ave., San Francisco 15, California
LUCY, CHARLES L., 422 Church St., Athens, Pennsylvania

MCALLISTER, J. GILBERT, Department of Anthropology, University of Texas, Austin, Texas
MCCANN, CATHERINE J., 251 South 41st St., Philadelphia 4, Pennsylvania
MCCARY, B. C., Box 123, College of William and Mary, Williamsburg, Virginia
MCCLELLAN, CATHERINE, 21 Hillside Court, Berkeley 4, California
MCCONNELL, H. N., 2151 Arapahoe St., Boulder, Colorado
MCCOWN, B. E., 3779 Kettner Blvd., San Diego 1, California
MCCOWN, MRS. ELIZABETH R., 1615 Scenic Ave., Berkeley, California
MCCOWN, THEODORE D., Department of Anthropology, University of California, Berkeley 4, California
MCDARMENT, CORLEY, 1108 N. Pitt St., Alexandria, Virginia
MCFARLAND, JAMES R., 600 Bellefontaine Ave., Marion, Ohio
MCFEELY, FRANCES, 11827 Goshen, Los Angeles 24, California
MCGREGOR, JOHN C., Department of Sociology and Anthropology, University of Illinois, Urbana, Illinois
MCILHENNY, E. A., Avery Island, Louisiana
MCKERN, WM. C., Milwaukee Public Museum, Milwaukee 3, Wisconsin
MCKINNY, J. J., DeWitt, Missouri
MCNAIRN, JOHN S., 8280 Epworth Blvd., Detroit 4, Michigan
MACGOWAN, ERNEST S., 4112 Colfax Ave., S., Minneapolis, Minnesota
MACGOWAN, KENNETH, 10737 LeConte Ave., Los Angeles 24, California
MACHAFFIE, E. D., State Publishing Co., Helena, Montana
MACKINNON, J. S., JR., P.O. Box 1504, Juneau, Alaska
MACNEISH, RICHARD, Museum of Anthropology, University Museums Bldg., Ann Arbor, Michigan
MADEIRA, PERCY C., JR., 100 South Broad St., Philadelphia 10, Pennsylvania
MADSEN, HARRY, Carpenter, South Dakota
MAHER, ROBERT F., 4612 N. Larkin St., Milwaukee 11, Wisconsin
MAIRS, O. L., 809 Pennsylvania Ave., Charleston, West Virginia
MALAMUD, CONSUELO G., 726 15th St., Santa Monica, California
MALOUF, CARLING, Department of Sociology, Montana State University, Missoula, Montana
MANNING, T. H., 37 Linden Terrace, Ottawa, Ontario, Canada
MANSFIELD, MARY, 913 Ventura, Albany, California

MARKMAN, DR. S. D., Art Department, Duke University, Durham, North Carolina
†MARRS, GARLAND JOHN, Department of Anthropology, University of New Mexico, Albuquerque, New Mexico
MARTIN, MRS. GEO. F., 437 Lincoln Park Drive, Evansville 14, Indiana
MARTIN, LESLIE A., 839 Spring Rd., Charleston 4, West Virginia
MARTIN, PAUL S., Chicago Natural History Museum, Chicago 5, Illinois
MARTINEZ DEL RIO, PABLO, Berlin 39, Mexico D.F., Mexico
MARYE, WILLIAM B., 207 E. Preston St., Baltimore 2, Maryland
MASON, DR. J. ALDEN, The University Museum, 33rd and Spruce Sts., Philadelphia 4, Pennsylvania
MATSON, FREDERICK R., School of Mineral Industries, Pennsylvania State College, State College, Pennsylvania
MAYER-OAKES, WILLIAM J., 901 E. 60th St., Chicago, Illinois
MAYR, THOMAS, Davidsonville, Maryland
MEGGERS, BETTY J., 2904 Brandywine St., Washington 8, D.C.
MERA, DR. H. P., Box 1426, Santa Fe, New Mexico
MERRILL, ROBERT H., 1111 Jefferson S.E., Grand Rapids, Michigan
MERRILL, ROBERT T., Pleasant Run Rd., R.F.D. No. 1, Flemington, New Jersey
MESERVE, MRS. KENNETH A., 3200 Beverly Drive, Dallas 5, Texas
METCALF, GEORGE, c/o River Basin Surveys, Burnett Hall, University of Nebraska, Lincoln, Nebraska
MEYER, RICHARD K., 3940 Prospect, Peoria, Illinois
MIDVALE, FRANK, 330 N. 11th St., Phoenix, Arizona
MILES, CHARLES, 5070 Cochrane Ave., Oakland 11, California
MILFORD, STANLEY J., Washington High School, Salinas, California
MILLER, ALLAN P., 2227 10th St., Berkeley, California
MILLER, CARL F., c/o Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.
MILLER, P. SCHUYLER, 306 Riverside Ave., Scotia 2, New York
MILLER, WALTER S., Mitla, Oaxaca, Mexico
†MILLIGAN, EDWARD A., Michigan, North Dakota
MILLS, JOHN E., 836 Washington Ave., Albany, California
MITCHELL, MRS. CHARLES M., 123 N. 6th St., Monroe, Louisiana
MOFFETT, ROSS, Provincetown, Massachusetts
MOHR, ALBERT, 305 Leroy, Arcadia, California
MOORE, MRS. GLEN E., 2515 E. Yandell, El Paso, Texas
MORGAN, FRED J., 1233 Lincoln Ave., Pasadena 3, California
MORGAN, DR. L. S. JR., 117 E. Madison St., Oklahoma City, Oklahoma
MORGAN, RICHARD, 154 East Kelso Rd., Columbus 2, Ohio
MORRIS, CARLYLE, 7005 Union Ave., Cleveland 5, Ohio
MORRIS, EARL H., P.O. Box 500, Boulder, Colorado
MORSS, NOEL, 568 South St., Needham, Massachusetts
MUDD, H. S., 1206 Pacific Mutual Bldg., Los Angeles 14, California
MULL, R. G., Dighton, Kansas
MULLOY, WILLIAM T., c/o Department of Sociology and Economics, University of Wyoming, Laramie, Wyoming
MURDOCK, GEORGE P., Department of Anthropology, Yale University, New Haven, Connecticut
MURRA, JOHN V., University of Puerto Rico, Rio Piedras, Puerto Rico

NASOM, C. H. W., Carmel Valley Route, Monterey, California
NELSON, JOHN, 7703 S.E. 21st Ave., Portland 2, Oregon
†NELSON, NELS C., American Museum of Natural History, New York 24, New York
NEUMANN, GEORG K., Museum of Anthropology, Library Bldg., Indiana University, Bloomington, Indiana
NEWCOMB, SIMON J., Palmer, Alaska
NEWHAM, RUSSELL W 44 Bonnie Lane, Berkeley 8, California
NOBLE, BRUCE, 414 College St., Waxahachie, Texas
NOBLE, DR. THOMAS B., JR., 1008 Hume Mansur Bldg., Indianapolis, Indiana
NOWOTNY, MRS. MARTHA EARL, Box 254, Shasta County, Summit City, California
NUSBAUM, JESSE L., Region Three, National Park Service, P.O. Box 1728, Santa Fe, New Mexico

O'FALLEN, R. S., Apartado 444, Santiago de Cuba, Cuba
OGITA, TOMOO, Department of Army Civilian, Civil Info. and Educ. Sect., APO 500, c/o PM, GHQ, SCAP, San Francisco, California
O'GRADY, LOUIS R., 1103 La Luz Drive, Albuquerque, New Mexico
O'LOUGHLIN, KATHLEEN, 129 Ontario St., St. Catherines, Ontario, Canada
OLSON, DR. RONALD L., Department of Anthropology, University of California, Berkeley 4, California
ORCHARD, FREDERICK P., Peabody Museum, Cambridge 38, Massachusetts
ORR, ELLISON, Waukon, Iowa
ORR, DR. KENNETH, Department of Anthropology, University of Chicago Chicago, Illinois
OSBORNE, DOUGLAS, River Basin Surveys, Pacific Coast Area, University of Oregon, Eugene, Oregon
OSGOOD, DR. CORNELIUS B., Peabody Museum, New Haven, Connecticut
OSWALT, WENDELL, Box 86, College, Alaska
OVER, W. H., University of South Dakota Museum, Vermillion, South Dakota

PALMATARY, HELEN C., Apt. 20, Arrott Arms, Frankford, Philadelphia, Pennsylvania
PARKER, DR. ARTHUR C., R.F.D., Naples, New York
PARKER, ARTHUR N., Box 316, Flasher, North Dakota
PASCO, GEORGE, 943 Metomen St., Ripon, Wisconsin
PAUL, DR. JOHN R., 49 Autumn St., New Haven, Connecticut
†PARK, DR. W. S., 560 Charleston Blvd., Las Vegas, Nevada
PEARSALL, MARION, Department of Anthropology, University of California, Berkeley, California
PECK, STUART, 3214 Urban Ave., Santa Monica, California
PELL, S. H., Fort Ticonderoga Museum, Fort Ticonderoga, New York
PENDLETON, LA VERNA, Smithsonian Institution, Washington, D.C.
PENNYPACKER, SAMUEL W., Pennypacker Mills, Schwenksville, Pennsylvania
PFIRMAN, KENNETH R., 347 East 17th St., Erie, Pennsylvania
PHELPS, GERARD W., Morrisville, Pennsylvania
PHILHOWER, CHAS. A., 303 Mountain Ave., Westfield, New Jersey
PHILLIPS, PHILIP, Peabody Museum, Cambridge 38, Massachusetts
PHILLIPS, WENDELL G., 98 Fairfield Ave., Box 503, Route 3, Concord, California
PIERCE, ROY G., c/o General Delivery, Salinas, California
PIERSON, LLOYD M. JR., Tonto National Monument, Roosevelt, Arizona
PILLING, ARNOLD R., Department of Anthropology, Univ. of California, Berkeley 4, California
PILORZ, ELIZABETH, 5 Scenic Ave., Piedmont, California
POLK, BENJAMIN, 659 Bay St., San Francisco, California
POLLOCK, H. E. D., 10 Frisbie Place, Cambridge 38, Massachusetts
POPE, GUSTAVUS D., JR., 244 Lawrence St., New Haven 11, Connecticut
PORTER, MURIEL N., 411 W. 116th St., Box 99, New York 27, New York
POTOSKY, NORMAN AND ROMAYNE, c/o C.A.A., Kenai, Alaska
POTTER, HAROLD, c/o Humble Oil and Refining Co., Tyler, Texas
PROFFITT, HARRY, P.O. Box 147, Hastings, Nebraska
PROSKOURIAKOFF, TATIANA, 10 Frisbie Place, Cambridge 38, Massachusetts
PROVINSE, S. M., Red Lodge, Montana

QUINLAN, JOSEPH J., 10 South St., Danville, New York
QUIMBY, GEORGE I. JR., Chicago Natural History Museum, Chicago 5, Illinois

RACER, DR. F. H., Box 457, Lomita, California
RADIN, PAUL, 2731½ Dwight Way, Berkeley, California
RANDS, ROBERT L., University of New Mexico, Albuquerque, New Mexico
RAINIER, DOROTHY LEE, Department of Anthropology, University of California, Berkeley 4, California
RASMUSSON, R. D., 417 So. Vine St., North Platte, Nebraska
RAY, DR. CYRUS N., President, Texas Archaeological and Paleontological Society, P.O. Box 62, Abilene, Texas
RAY, J. HENRY, Yamparika and Fannin St., Vernon, Texas
RAYNOR, MRS. DOROTHY E., Box 57, Montauk Highway, Eastport, New York
REED, ERIK K., P.O. Box 461, Santa Fe, New Mexico
REEVES, COL. DACHE M., 39 W. Chester St., Valley Stream, Long Island New York
REITER, PAUL, University of New Mexico, Albuquerque, New Mexico
RETZEK, REV. HENRY, St. Michael Church, Spring Hill, Melrose P.O., Minnesota
RICH, WENDELL O., Institute of Religion, College Hill, Logan, Utah
RIDDELL, FRANCIS A., 1420 Jefferson St., Delano, California
RIDDELL, HARRY S., 1420 Jefferson St., Delano, California

RIDLEY, FRANK, 325 Burnhamthorpe Rd., R.R. #1, Islington, Ontario
REISENBERG, SAUL H., Department of Anthropology, University of California, Berkeley 4, California
RIGHTS, REV. DOUGLAS L., Box 133, Salem Station, Winston Salem, North C rolina
RILEY, CARROLL L., 1801 Centinela, Santa Monica, California
RINALDO, JOHN B., Chicago Natural History Museum, Chicago 5, Illinois
RITCHIE, WILLIAM A., Rochester Museum of Arts and Sciences, Rochester, New York
ROBERTS, DR. FRANK H. H., JR., Bureau of American Ethnology, Washington 25, D.C.
ROBERTS, JOHN M., Dept. of Social Relations, Harvard University, 64 Plympton St., Cambridge, Massachusetts
ROBERTS, TRAVIS, Marathon, Texas
ROGERS, EDWARD S., Lincoln, Vermont
ROGERS, MURRAY H., 11 Waban St., Natick, Massachusetts
ROGERS, SPENCER L., 920 Martinez St., San Diego 6, California
ROOT, W. C., 226 Main St., Brunswick, Maine
ROUSE, IRVING, Peabody Museum, New Haven, Connecticut
ROUSH, FRED, Meriwether Lewis Nat'l. Monument, Hohenwald, Tennessee
ROWE, JOHN H., Department of Anthropology, University of California, Berkeley, California
ROWE, PAUL R., Route 1, Glenwood, Iowa
ROYS, LAWRENCE, 825 27th St., Moline, Illinois
ROYS, RALPH, 1512 Olin Pl., Seattle 2, Washington
RUDY, JACK R., 1627 Denver St., Salt Lake City, 4, Utah
RUPPERT, KARL, 10 Frisbie Place, Cambridge 38, Massachusetts
RUSTE, L. GERHARD, Montrose, South Dakota
RUTHENBURG, LOUIS, 518 S.E. Riverside Dr., Evansville 9, Indiana
RUYLE, DR. J. B., 1 Main St., Champaign, Illinois
RYE, OWEN E., P.O. Box 67, College, Alaska

SALTSMAN, LT. COMDR. IRL L., CEC, USNR, NOB, Navy 3002, c/o The Fleet Post Office, San Francisco, California
SANKALIA, DR. H. D., Deccan College Post Graduate and Research Institute, 10 Connaught Road, Poona 1, India
SARGENT, HOWARD R., 939 Yale Station, New Haven, Connecticut
SASSAMAN, WILLIAM H., Department of Anatomy, School of Medicine, Western Reserve University, Cleveland, Ohio
SATTERTHWAITE, LINTON, University Museum, 33rd and Spruce Sts., Philadelphia 4, Pennsylvania
SAYLES, E. B., CURATOR, Arizona State Museum, Tucson, Arizona
SCHAEDEL, RICHARD P., c/o Instituto de Antropologia, Universidad Nacional de Trujillo, Trujillo, Peru
SCHAEFER, C. E., Museum of the Plains Indian, Browning, Montana
SCHAEFER, VINCENT, Box 31, R.D. 3, Schermerhorn Rd., Schenectady, New York
SCHMIDT, PAUL H., Suite 703, Old National Bank Bldg., Evansville 16, Indiana
SCHMITT, KARL, JR., Department of Anthropology, The University of Oklahoma, Norman, Oklahoma
SCHOENBECK, GEORGE, 821 Heading Ave., Peoria 5, Illinois
SCHROEDER, ALBERT H., Montezuma Well, Rimrock, Arizona
SCHULTZ, C. BERTRAND, Nebraska State Museum, University of Nebraska, Lincoln 8, Nebraska
SCHULTZ, FLOYD, Box 347, Clay Center, Kansas
SCHULTZ, WILLIAM, Route 4, Marengo, Iowa
SCHUMACHER, PAUL, 309 Meetinghouse Rd., Jenkintown, Pennsylvania
SCHUMANN, GEORGE O., University of Alaska, College, Alaska
SCHWAB, ROBERT, P.O. Box 549, Golden, Colorado
SCHWARTZ, DOUGLAS W., Box 1003, University Station, Lexington, Kentucky
SCOTT, DONALD, Peabody Museum, Harvard University, Cambridge 38, Massachusetts
SEARS, WILLIAM H., Department of Anthropology and Archaeology, University of Georgia, Athens, Georgia
SETZLER, F. M., U.S. National Museum, Washington 25, D.C.
SHADE, CHARLES I., 340 Harvard St., Cambridge 39, Massachusetts
SHAFER, JAMES, 570 Main St., Poughkeepsie, N.Y.
SHALKOP, ROBERT L., 5615 Woodlawn Ave., Chicago 37, Illinois
SHEPARD, ANNA O., 751 11th St., Boulder, Colorado
SHERMAN, CHARLES F., R.F.D. No. 1, Plymouth, Massachusetts
SHETRONE, H. C., Ohio State Museum, Columbus, Ohio
SHIPPEE, J. M., R.F.D. 10, North Kansas City, Missouri
SHUTLER, DICK JR., Department of Anthropology, University of California, Berkeley 4, California
SIMPSON, RUTH D., 840 Fairfield Circle, Pasadena 5, California
SKARLAND, IVAR, College, Alaska
SLEIGHT, FREDERICK W., Mount Dora, Florida
SLUSSER, MARY, 330 N. Piedmont St., Apt. 2, Arlington, Virginia
SMAIL, WILLIAM, R.R., Loogootee, Illinois
SMALL, JAMES F., 2518 Saratoga Drive, Louisville, Kentucky
SMILEY, TERAH L., Laboratory of Tree Ring Research, University of Arizona, Tucson, Arizona
SMITH, A. LEDYARD, 10 Frisbie Pl., Cambridge 38, Massachusetts
SMITH, ARTHUR GEORGE, 80 North Foster St., Norwalk, Ohio
SMITH, BENJAMIN L., 64 Sudbury Rd., Concord, Massachusetts
SMITH, C. E. JR., 2306 Durant Ave., Berkeley, California
SMITH, CARLYLE S., Museum of Natural History, University of Kansas, Lawrence, Kansas
SMITH, HALE, 11235 South Western Ave., Chicago 43, Illinois
SMITH, MARIAN W., Department of Anthropology, Columbia University, New York 27, New York
SMITH, MRS. RALPH W., P.O. Box 514, Ely, Nevada
SMITH, ROBERT ELIOT, Carnegie Institution, 9A Avenida Norte No. 54, Guatemala, C.A.
SMITH, VICTOR J., Box 128, West Texas Historical and Scientific Society, Museum Bldg., Alpine, Texas
SMITH, WATSON, Peabody Museum, Cambridge 38, Massachusetts
SNODGRASS, O. T., New Mexico State Teachers College, Silver City, New Mexico
SNOW, CHARLES E., 1851 S. Limestone St., Lexington 33, Kentucky
SNYDER, MRS. SUZANNE R., P.O. Box 682, Marysville, California
SODAY, FRANK J., 1124 West Elm St., El Dorado, Arkansas
SOLECKI, RALPH, Box 192, Cutchogue, Long Island, New York
SPALDING, ALBERT C., Museum of Anthropology, University Museums Bldg., University of Michigan, Ann Arbor, Michigan
SPECK, DR. FRANK G., University of Pennsylvania, Philadelphia 4, Pennsylvania
SPEIGHT, GLENN, West Branch, Iowa
SPIER, DR. LESLIE, P.O. Box 880, Santa Cruz, California
SPINDEN, DR. H. J., Brooklyn Museum, Brooklyn, New York
STACKELBERG, THE BARON, 1673 Columbia Road, N.W., Washington, D.C.
STEPHENS, B. W., 815 Broadway, Quincy, Illinois
STEPHENSON, ROBERT L., P.O. Box 4066, Austin, Texas
STERN, THEODORE, Department of Anthropology, University of Oregon, Eugene, Oregon
STEWARD, DR. JULIAN H., Department of Anthropology, Columbia University, New York, New York
STEWART, KENNETH M., Arizona State College, Tempe, Arizona
STEWART, OMER C., Department of Anthropology, University of Colorado, Boulder, Colorado
STILES, N. L., Cherokee, Iowa
STIRLING, M. W., Bureau of American Ethnology, Washington 25, D.C.
STONE, CLAUDE U., 210 West Armstrong, Peoria, Illinois
STONE, MRS. DORIS Z., Apartado 1309, San José, Costa Rica, C.A.
STONE, R. J., Sunnyside, Washington
STONER, REV. VICTOR R., Greenway Station, Tucson, Arizona
STOUT, DAVID B., Department of Sociology and Anthropology, Syracuse University, Syracuse, New York
STRAIGHT, DAVID M., 478 Love Lane, East Greenwich, Rhode Island
STRESSER-PEAN, GUY, 28 Avenue du Maine, Paris 15e, France
STRONG, WM. DUNCAN, Department of Anthropology, Columbia University, New York 27, New York
STUDER, FLOYD V., 637 Amarillo Bldg., Amarillo, Texas
STURDY, HENRY FRANCIS, 85 Shipwright St., Annapolis, Maryland
SUMMERS, PAUL L., Stamford, Texas
SURATT, R. J., Office of the U.S. Commissioner, Wrangell, Alaska
SWANTON, DR. JOHN R., 22 George St., Newton 58, Massachusetts
SWART, JOHN A., R.F.D. No. 1, Amsterdam, New York
SWAUGER, JAMES L., 412 Swissvale Ave., Pittsburgh, 21, Pennsylvania
SWEET, LOUISE E., 5143 South Kenwood, Chicago 15, Illinois

TARR, JOHN S., Box 94, University of New Mexico, Albuquerque, New Mexico
TATUM, ENSIGN R. M., U.S.S. Frank Knox, P.O. 742, c/o Fleet P.O., San Francisco, California

TAYLOR, WALTER W., JR., 711 Camino del Monte Sol, Santa Fe, New Mexico
THOMPSON, J. ERIC S., Harvard, Massachusetts
THOMPSON, RAYMOND H., 504 Concord Ave., Belmont, Massachusetts
TILTON, W. G., 1615 West 21st, Topeka, Kansas
TITTERINGTON, DR. P. F., 212 Metropolitan Bldg., St. Louis, Missouri
TOMLINSON, ERNEST P., Route 2, Box 848, Escondido, California
TONG, MARVIN E., JR., 758 East Cherokee St., Springfield, Missouri
TORREY, HOWARD, 247 Summer Ave., Reading, Massachusetts
TOULOUSE, JOSEPH H., General Delivery, Sandia Base Branch, Albuquerque, New Mexico
TOWLE, MARGARET A., 3 Concord Ave., Cambridge 38, Massachusetts
TOZZER, DR. ALFRED M., 7 Bryant St., Cambridge 38, Massachusetts
TREGANZA, ADAN E., 2318 Glen Ave., Berkeley, California
TROWBRIDGE, H. M., Route 1, Bethel, Kansas
†TRUMBULL, MRS. MARJORIE R. S., Currytuck Road, Newtown, Connecticut
TSCHOPIK, HARRY JR., American Museum of Natural History, Department of Anthropology, New York 24, N.Y.
TURNQUIST, J., Walwort, Saskatchewan, Canada
TWEET, DAVID R., P.O. Box 1272, Albuquerque, New Mexico
TYZZER, DR. ERNEST E., 175 Wafer St., Wakefield, Massachusetts

UNDERWOOD, JOHN E., Box 82, Dubois, Wyoming

VAN STAN, INA, 3413 Race St., Philadelphia 4, Pennsylvania
VICKERS, CHRIS, Baldur, Manitoba, Canada
VON SCHLICTEN, HAROLD C., Lockwood Hill Rd., Route 7, Box 376A, Cincinnati 11, Ohio

WADSWORTH, MRS. J. R., 64 B Ct. K, Stadium Terrace, Champaign, Illinois
WALKER, EDWIN F., The Southwest Museum, Highland Park, Los Angeles 42, California
WALLACE, WILLIAM J., Department of Anthropology, Indiana University, Bloomington, Indiana
WALSER, P. H., 1102 North 1st St., Temple, Texas
WARD, LAURISTON, Peabody Museum, Cambridge 38, Massachusetts
WARDLE, MISS H. NEWELL, Sharon Hill, Pennsylvania
WARING, ANTONIO J., JR., 2912 Atlantic Ave., Savannah, Georgia
WASDYKE, WALTER J., 26 5th Ave., Clifton, New Jersey
WATSON, MRS. JAMES B., 30 Faculty Lane, St. Louis 5, Missouri
WAUCHOPE, ROBERT, Middle American Research Institute, Tulane University, New Orleans, Louisiana
WEBB, DR. C. H., 1560 Line Ave., Shreveport, Louisiana
WEBB, WILLIAM ROBERT, Webb School, Claremont, California
WEBB, WILLIAM S., University of Kentucky, Lexington, Kentucky
WECKLER, JOE, JR., Department of Anthropology, University of Southern California, Los Angeles 7, California
WEDEL, DR. WALDO R., U.S. National Museum, Washington 25, D.C.
WEER, PAUL W., 5650 N. Meridian St., Indianapolis 8, Indiana
WEIANT, DR. C. W., 55 W. 42nd St., New York, New York
WEIR, ALISTAIR M., 134 East Brickley, Hazel Park, Michigan
WEISSMAN, S. D., 82 Devonshire St., Boston, Massachusetts
WEITZEL, R. B., 426 Bond Bldg., 14th and New York Ave., N.W., Washington 5, D.C.
WELCH, MRS. JANE C., 3800 Roanoke Rd., Kansas City, Missouri
WELLMAN, PAUL I., 10514 Wyton Rd., Los Angeles 24, California
WENDORF, FRED, Peabody Museum, Harvard University, Cambridge 38, Massachusetts
WENNER, DAVID J., JR., 7316 South Merrill Ave., Chicago 49, Illinois
WESTCOTT, W. B., Springdale Ave., Dover, Massachusetts
WETTLAUFER, BOYD, Apt. 156, Sunset Mesa, University of New Mexico, Albuquerque, New Mexico
WHALEY, J. KIRKWOOD, 6438 North Richard St., Milwaukee, Wisconsin
WHEAT, JOSEPH B., Department of Anthropology, University of Arizona, Tucson, Arizona
WHEELER, MERLYN H., P.O. Box 128, Starkey, New York
WHITE, MARIAN E., 50 Fenimore Ave., Buffalo 15, New York
WHITEFORD, ANDREW H., Logan Museum, Beloit College, Beloit, Wisconsin
WHITING, ALFRED F., Tumacacori, Arizona
WHITNEY, JEAN, Pinebrook, Montague, Michigan
WILDONER, KENNETH R., 5380 Capary Rd., West Riverside, California
WILFORD, LLOYD A., Department of Anthropology, University of Minnesota, Minneapolis, Minnesota
WILL, GEORGE F., 322 4th, Bismarck, North Dakota
WILLEY, GORDON R., Bureau of American Ethnology, Washington 25, D.C.
WILLIAMSON, A. P., Lake Andes, South Dakota
WILLIAMSON, GEORGE HUNT, Granite Dells Lodge, Jerome Route, Prescott, Arizona
WILSON, JAMES D., 3 High Drive, Eastborough, Wichita, Kansas
WINTERHOUSE, JOHN, JR., 17 South 4th East, Salt Lake City, Utah
WITHERS, ARNOLD M., c/o Department of Anthropology, University of Denver, Denver 10, Colorado
WITTE, A. H., Henrietta, Texas
WITTHOFT, JOHN, State Museum Bldg., Harrisburg, Pennsylvania
WOFFORD, J. H., JR., Box 17, Atco, Georgia
WOODBURY, S. SGT. RICHARD B., 1801 Hoban Road, N.W., Washington 7, D.C.
WRAY, CHAS. F., West Rush, New York
WRAY, DONALD E., 608 N. Prospect Ave., Champaign, Illinois
WRIGHT, ROSS PIER, 235 West 6th, Erie, Pennsylvania
WULSIN, LUCIEN, 1801 Gilbert Ave., Cincinnati, Ohio

YERGASON, DR. R. M., 50 Farmington Ave., Hartford 5, Connecticut
YORKE, GABRIEL, 227 South Woodburn Ave., Los Angeles 24, California

INSTITUTIONS

ABORIGINAL RESEARCH CLUB, Box 224, Algonac, Michigan
ACADEMIA SINICA, Institute of History and Philology, c/o Taiwah University, Taipeh, China
ADAMS STATE TEACHERS COLLEGE LIBRARY, Alamosa, Colorado
AMERICAN ANTIQUARIAN SOCIETY, Worcester, Massachusetts
AMERICAN GEOGRAPHICAL SOCIETY, Broadway at 156th St., New York 32, New York
AMERICAN MUSEUM OF NATURAL HISTORY LIBRARY, 77th St. and Central Park West, New York 24, New York
AMERICAN PHILOSOPHICAL SOCIETY LIBRARY, 222 Drexel Bldg., Philadelphia, Pennsylvania
AMHERST COLLEGE LIBRARY, Amherst, Massachusetts
ANTHROPOLOGY CLUB, Social Science Bldg., Room 225, 1126 East 59th St., Chicago 37, Ill.
ARCHAEOLOGICAL SOCIETY OF VIRGINIA, Edmund B. Sacrey, Secretary, 1322 Avondale Ave., Richmond, Virginia
ARIZONA PIONEERS HISTORICAL SOCIETY, Mrs. George F. Kitt, Secretary, Tucson, Arizona

BANDELIER NATIONAL MONUMENT LIBRARY, P.O. Box 1728, Santa Fe, New Mexico
BELOIT COLLEGE LIBRARY, Beloit, Wisconsin
BIBLIOTEKA AKAD. NAUK, Ul Frunze 11, Moscow 19, USSR
BIBLIOTEKA AKAD. NAUK, Ul Abdully Tukaeva 1, Tashkent, USSR
BIBLIOTEKA AKADEMII, NAUK SSSR, Birgevaia Linia 1, Leningrad 164, USSR
BOSTON PUBLIC LIBRARY, Copley Square, Boston, Massachusetts
BOSTON SOCIETY OF NATURAL HISTORY, New England Museum of Natural History, M. B. Cobb, Librarian, 109 Chestnut St., Boston 8, Massachusetts
BOSTON UNIVERSITY LIBRARY, College of Liberal Arts, 725 Commonwealth Ave., Boston, Massachusetts
BOWDOIN COLLEGE LIBRARY, Hubbard Hall, Brunswick, Maine
BRITISH MUSEUM, Department of Ethnography, London, W.C. 1, England
BRITISH MUSEUM LIBRARY, c/o Stevens & Brown Ltd., New Ruskin House, Little Russell St., London, W.C. 1, England
BROOKLYN MUSEUM LIBRARY, Brooklyn, New York
BRYN MAWR COLLEGE LIBRARY, Bryn Mawr, Pennsylvania
BUFFALO MUSEUM OF SCIENCE, RESEARCH LIBRARY, Humboldt Park, Buffalo 11, New York
BUREAU OF AMERICAN ETHNOLOGY LIBRARY, Smithsonian Institution, Washington 25, D.C.
BUREAU OF GEOLOGY AND TOPOGRAPHY, DEPARTMENT OF MINES AND RESOURCES, Ottawa, Ontario, Canada

CALIFORNIA STATE LIBRARY, Sacramento, California
CARNEGIE MUSEUM, Schenley Park, Pittsburgh, Pennsylvania

CHICAGO NATURAL HISTORY MUSEUM LIBRARY, Roosevelt Rd. and Field Drive, Chicago 5, Illinois
CHICAGO PUBLIC LIBRARY, 78 E. Washington St., Chicago 2, Illinois
CINCINNATI MUSEUM OF NATURAL HISTORY, Central Parkway at Walnut St., Cincinnati 10, Ohio
CLARK UNIVERSITY LIBRARY, Worcester 3, Massachusetts
CLEVELAND PUBLIC LIBRARY, 325 Superior Ave., N.E., Cleveland, Ohio
COLORADO COLLEGE MUSEUM, W. W. Postlethwaite, Director, Colorado Springs, Colorado
COLORADO MUSEUM OF NATURAL HISTORY, H. M. Wormington, Curator of Archaeology, City Park, Denver 6, Colorado
COLUMBIA UNIVERSITY LIBRARY, New York 27, New York
CONNECTICUT STATE LIBRARY, Hartford 1, Connecticut
CORNELL UNIVERSITY LIBRARY, Ithaca, New York
CRANBROOK INSTITUTE OF SCIENCE, Bloomfield Hills, Michigan

DARTMOUTH COLLEGE LIBRARY, Hanover, New Hampshire
DAVENPORT PUBLIC MUSEUM, 704 Brady St., Davenport, Iowa
DEPARTMENT OF LIBRARY AND ARCHIVES, State House, Phoenix, Arizona
DETROIT PUBLIC LIBRARY, Woodward and Kirby Ave., Detroit 2, Michigan
DUKE UNIVERSITY LIBRARY, Durham, North Carolina
DURANGO PUBLIC LIBRARY, Durango, Colorado

EMORY UNIVERSITY LIBRARY, Emory University, Georgia
ENOCH PRATT FREE LIBRARY, Cathedral, Franklin and Mulberry Sts., Baltimore 1, Maryland
ESCUELA NACIONAL DE ANTROPOLOGÍA, Moneda 13, Mexico D.F.
ETNOGRAFISKA MUSEET, N. Hamngatan 12, Göteborg, Sweden

FORT WAYNE AND ALLEN COUNTY, PUBLIC LIBRARY, 310 West Wayne St., Fort Wayne 2, Indiana
FREE LIBRARY OF PHILADELPHIA, PERIODICAL DEPARTMENT, Middle City, West Dist., Philadelphia 3, Pennsylvania

GILA PUEBLO, Globe, Arizona
GOS NAUCHN BIBLIOTEKA, Minist Vyssh Obrazov, Pl. Nogina 25, Moscow, USSR
GOSUDARSTVENNAJA, BIB-KA SSSR IM LENINA, Ul Kalinina 3, Moscow, USSR

HAMLINE UNIVERSITY LIBRARY, St. Paul, Minnesota
HARVARD COLLEGE LIBRARY, SERIAL DIVISION, Cambridge 38, Massachusetts
HUNTER COLLEGE LIBRARY, Bedford Park Blvd. and Golden Ave., Bronx 63, New York
HUNTER COLLEGE LIBRARY, 695 Park Ave., New York 21, New York
HUNTER COLLEGE OF THE CITY OF NEW YORK, 126 E. 69th St., New York 21, New York

ILLINOIS STATE MUSEUM, 5th Floor, Centennial Bldg., Springfield, Illinois
INDIANA STATE LIBRARY, Indianapolis, Indiana
INDIANA UNIVERSITY LIBRARY, Bloomington, Indiana
INDIANAPOLIS PUBLIC LIBRARY, St. Clair Square, Indianapolis 4, Indiana
INSTITUTO NACIONAL DE ANTROPOLOGÍA E HISTORIA, S. E. P. Tesorería, Cordoba Num. 73, Mexico, D.F., Mexico

JOHNS HOPKINS UNIVERSITY LIBRARY, Baltimore 18, Maryland
JOHNSON CAMDEN LIBRARY, Moorehead State Teachers College, Moorehead, Kentucky
JOINT UNIVERSITY LIBRARY, Nashville 4, Tennessee

MUSEUM OF THE KALAMAZOO PUBLIC LIBRARY, 311 South Rose St., Kalamazoo 13, Michigan

LA BIBLIOTHÈQUE, MUSÉE DE L'HOMME, Palais de Chaillot, Place du Trocadero, Paris 16e, France
LIBR. FACULTAD DE CIENCIAS, MATEMATICAS CR. LIBRERIA, Del Colegio S.A., Alsina y Bolivar R. 71, Buenos Aires, Argentina
LOS ANGELES COUNTY MUSEUM, Exposition Park, Los Angeles 7, California
LOS ANGELES PUBLIC LIBRARY, SERIALS DIVISION, 630 West 5th St., Los Angeles 13, California
LOUISIANA STATE UNIVERSITY LIBRARY, PERIODICAL DIVISION, Baton Rouge 3, Louisiana

MASSACHUSETTS STATE LIBRARY, 341 State House, Boston 33, Massachusetts
MESA VERDE MUSEUM, Mesa Verde National Park, Colorado
MICHIGAN STATE COLLEGE LIBRARY, East Lansing, Michigan
MIDDLE AMERICAN RESEARCH INSTITUTE, THE TULANE UNIVERSITY, New Orleans, Louisiana
MILWAUKEE PUBLIC LIBRARY, 814 West Wisconsin Ave., Milwaukee 3, Wisconsin
MILWAUKEE PUBLIC MUSEUM, Milwaukee 3, Wisconsin
MINNEAPOLIS ATHANEUM, 1001 Hennepin Ave., Minneapolis 2, Minnesota
MINNESOTA HISTORICAL SOCIETY, St. Paul 1, Minnesota
MONTANA STATE UNIVERSITY LIBRARY, Missoula, Montana
MORRISON LIBRARY, UNIVERSITY OF WICHITA, Wichita, Kansas
MUSEUM OF THE AMERICAN INDIAN, HEYE FOUNDATION, Broadway at 155th St., New York 32, New York
MUSEUM OF NATURAL HISTORY, City Library Association, Springfield, Massachusetts
MUSEUM OF NEW MEXICO LIBRARY, Santa Fe, New Mexico
MUSEO NACIONAL DE ARQUEOLOGÍA Y ETNOLOGÍA, Att: Argentina Diaz Lozano, La Aurora, Guatemala, Central America
MCGILL UNIVERSITY LIBRARY, 3459 McTavish St., Montreal, Canada

NATIONAL MUSEUM, DEPARTMENT OF ETHNOLOGY, 10 Ny Vestergade, Copenhagen, Denmark
NATIONAL PARK SERVICE, REGION ONE OFFICE, Laurel and Main St., Richmond 20, Virginia
NATIONAL PARK SERVICE, c/o Dr. Porter, Room 3311, Department of Interior Bldg., Washington 25, D.C.
NATIONAL SUN YAT SEN UNIVERSITY, DEPARTMENT OF ANTHROPOLOGY, Canton, China
NATIONALSBIBLIOTHEK, Josefsplatz, Vienna, Austria
NEWBERRY LIBRARY, 60 West Walton Place, Chicago, Illinois
NEWARK FREE PUBLIC LIBRARY, 5 Washington St., Newark 2, New Jersey
NEW JERSEY STATE MUSEUM, State House Annex, Trenton 7, New Jersey
NEW YORK PUBLIC LIBRARY, 5th Ave. and 42nd St., New York 18, New York
NEW YORK STATE LIBRARY, Albany 1, New York
NORTHWESTERN UNIVERSITY LIBRARY, Evanston, Illinois

OAKLAND PUBLIC LIBRARY, 659 14th St., Oakland 12, California
OBERLIN COLLEGE LIBRARY, Oberlin, Ohio
OCMULGEE NATIONAL MONUMENT, Macon, Georgia
OHIO STATE ARCHAEOLOGICAL AND HISTORICAL SOCIETY LIBRARY, Ohio State Museum, Columbus 10, Ohio
ORBIS, Stalinova 46, Prague XII, Czechoslovakia
OREGON STATE LIBRARY, State Library Bldg., Salem, Oregon

PAN AMERICAN UNION, Washington 6, D.C.
PEABODY MUSEUM LIBRARY, Harvard University, Cambridge 38, Massachusetts
R. S. PEABODY FOUNDATION, Phillips Academy, Andover, Massachusetts
PEABODY MUSEUM, Salem, Massachusetts
PEABODY MUSEUM OF NATURAL HISTORY, Yale University, New Haven, Connecticut
PITT RIVERS MUSEUM, Oxford University, Oxford, England
PRINCETON UNIVERSITY LIBRARY, Princeton, New Jersey
PROVINCIAL LIBRARY, Province of Manitoba, Canada
PUBLITSCHNAIA BIBLIOTEKA, Sadowaia Ul 18, Leningrad, USSR

REED COLLEGE LIBRARY, Portland 2, Oregon
REGION THREE HEADQUARTERS, NATIONAL PARK SERVICE, Box 1728, Santa Fe, New Mexico
ROLLINS COLLEGE LIBRARY, Winter Park, Florida
ROYAL ONTARIO MUSEUM OF ARCHAEOLOGY, Toronto, Ontario, Canada
RUTGERS UNIVERSITY LIBRARY, New Brunswick, New Jersey

SACRAMENTO COLLEGE LIBRARY, 3835 Freeport Blvd., Sacramento, California

ST. MARY'S SEMINARY LIBRARY, Roland Park, Baltimore, Maryland
SAN DIEGO SCIENTIFIC LIBRARY, Att: M. F. Farmer, Balboa Park, San Diego, California
SAN FRANCISCO STATE COLLEGE, 125 Buchanan St., San Francisco 2, California
SANTA BARBARA FREE PUBLIC LIBRARY, Santa Barbara, California
SANTA BARBARA MUSEUM OF NATURAL HISTORY, Mr. A. L. Cogghesall, Director, Mission Canyon, Santa Barbara, California
SASKATOON ARCHAEOLOGICAL SOCIETY, H. K. Cronk, President, 135 7th St., Saskatoon, Sask., Canada
SCIENCE SERVICE, INC., 1719 N St., N.W., Washington 6, D.C.
SCIENTIFIC LIBRARY DIVISION, BUREAU OF SCIENCE, Manila, P.I
SMITHSONIAN INSTITUTION LIBRARY, Washington 25, D.C.
SOCIETY FOR ARCHAEOLOGICAL RESEARCH, c/o Mrs. Louise Sheldon, 221 S. Union St., Independence, Missouri
SOCIETY FOR PENNSYLVANIA ARCHAEOLOGY, L. E. Wilt, President, Andaste Chapter, Towanda, Pennsylvania
ST. LOUIS PUBLIC LIBRARY, Olive, 13th and 14th Sts., St. Louis 3, Missouri
ST. LOUIS UNIVERSITY LIBRARY, Grand and Pine Blvds., St. Louis, Missouri
ST. PAUL INSTITUTE, 51 University Ave., St. Paul 3, Minnesota
STANFORD UNIVERSITY LIBRARIES, Palo Alto, California
STATE COLLEGE OF WASHINGTON LIBRARY, ACQUISITION DEPARTMENT, SERIALS SECTION, Pullman, Washington
STATE HISTORICAL SOCIETY OF NORTH DAKOTA, Bismarck, North Dakota
STATE UNIVERSITY OF IOWA LIBRARY, SERIALS SECTION, Iowa City, Iowa
SYRACUSE UNIVERSITY LIBRARY, Syracuse 10, New York

TAYLOR MUSEUM, West Dale St., Colorado Springs, Colorado
TEXAS TECHNOLOGICAL COLLEGE LIBRARY, Lubbock, Texas
TEXAS TECHNOLOGICAL COLLEGE MUSEUM, Lubbock, Texas
TULSA PUBLIC LIBRARY, ADULT REFERENCE DEPARTMENT, 220 S. Cheyenne, Tulsa 3, Oklahoma

UNIVERSITETSBIBLIOTEKET, 1 Bergen, Norway
UNIVERSITY OF ALASKA LIBRARY, College, Alaska
UNIVERSITY OF ALBERTA LIBRARY, Edmonton, Alberta, Canada
UNIVERSITY OF ARIZONA LIBRARY, Tucson, Arizona
UNIVERSITY OF ARKANSAS LIBRARY, Fayetteville, Arkansas
UNIVERSITY OF BRITISH COLUMBIA LIBRARY, Vancouver, Canada
UNIVERSITY OF CALIFORNIA LIBRARY, Berkeley 4, California
UNIVERSITY OF CALIFORNIA AT LOS ANGELES LIBRARY, 405 Hilgard Ave., Los Angeles 24, California
UNIVERSITY OF CHICAGO LIBRARY, PERIODICAL DEPARTMENT, Chicago, Illinois
UNIVERSITY OF CINCINNATI GENERAL LIBRARY, Campus Station, Cincinnati 21, Ohio
UNIVERSITY OF COLORADO LIBRARY, Boulder, Colorado
UNIVERSITY OF DENVER, MARY REED LIBRARY, University Park, Denver 10, Colorado
UNIVERSITY OF FLORIDA LIBRARY, Gainesville, Florida
UNIVERSITY OF GEORGIA GENERAL LIBRARY, Athens, Georgia
UNIVERSITY OF ILLINOIS LIBRARY, PERIODICAL DIVISION, Urbana, Illinois
UNIVERSITY OF KANSAS LIBRARY, Lawrence, Kansas
UNIVERSITY OF KENTUCKY LIBRARY DEPARTMENT, Lexington 29, Kentucky
UNIVERSITY OF MICHIGAN GENERAL LIBRARY, Ann Arbor, Michigan
UNIVERSITY OF MINNESOTA LIBRARY, Minneapolis 14, Minnesota
UNIVERSITY OF MISSOURI GENERAL LIBRARY, Columbia, Missouri
UNIVERSITY MUSEUM LIBRARY, 33rd and Spruce Sts., Philadelphia 4, Pennsylvania
UNIVERSITY OF NEBRASKA LIBRARY, Lincoln 8, Nebraska
UNIVERSITY OF NEW MEXICO, Dept. of Anthropology, Albuquerque, New Mexico
UNIVERSITY OF NEW MEXICO LIBRARY, Albuquerque, New Mexico
UNIVERSITY OF NORTH CAROLINA LIBRARY, Chapel Hill, North Carolina
UNIVERSITY OF NORTH DAKOTA, University Station, Grand Forks, North Dakota
UNIVERSITY OF NOTRE DAME LIBRARY, Notre Dame, Indiana
UNIVERSITY OF OKLAHOMA LIBRARY, Norman, Oklahoma
UNIVERSITY OF OREGON LIBRARY, Eugene, Oregon
UNIVERSITY OF SOUTH CAROLINA, MCKISSICK MEMORIAL LIBRARY, Columbia 19, South Carolina
UNIVERSITY OF SOUTHERN CALIFORNIA LIBRARY, University Park, Los, Angeles 7, California
UNIVERSITY OF TENNESSEE LIBRARY, Knoxville 16, Tennessee
UNIVERSITY OF TEXAS LIBRARY, Austin 12, Texas
UNIVERSITY OF TULSA LIBRARY, 7th and College, Tulsa, Oklahoma
UNIVERSITY OF UTAH LIBRARY, Salt Lake City, Utah
UNIVERSITY OF WASHINGTON LIBRARY, ACQUISITIONS DIVISION, Seattle 5, Washington

VAN EPPS HARTLEY CHAPTER, NEW YORK STATE ARCHAEOLOGICAL ASSOCIATION, Schenectady Museum, 37 Steuben St., Schenectady, New York
VASSAR COLLEGE LIBRARY, Poughkeepsie, New York
VIKING FUND, INC., 14 East 71st St., New York 21, New York

WALNUT CANYON NATIONAL MONUMENT LIBRARY, Box 400, R.R. 1, Flagstaff, Arizona
WASHINGTON SQUARE LIBRARY, NEW YORK UNIVERSITY, 100 Washington Square E., New York 3, New York
WASHINGTON UNIVERSITY LIBRARY, St. Louis 5, Missouri
WEST VIRGINIA UNIVERSITY LIBRARY, Morgantown, West Virginia
WESTERN STATE COLLEGE, Gunnison, Colorado
WHEATON COLLEGE LIBRARY, Wheaton, Illinois
WILLAMETTE UNIVERSITY LIBRARY, Salem, Oregon
WILBUR CROSS LIBRARY, University of Connecticut, Storrs, Connecticut
WISCONSIN STATE HISTORICAL SOCIETY LIBRARY, 816 State St., Madison 6, Wisconsin
WYOMING HISTORICAL AND GEOLOGICAL SOCIETY, 69 S. Franklin St., Wilkes Barre, Pennsylvania

YALE UNIVERSITY LIBRARY, New Haven, Connecticut

INDEX OF VOLUME XIV

AAA Annual Index of 16-Millimeter Anthropological Films, 159.

Additional Data on Crania from the Warren Mounds, 224.

Alaska: Diagonal Flaking from Kotzebue, 127; Flint Stations in Central Alaska, 116; Notes on the Archaeology of the Utukok River, Northwestern Alaska, 62.

ANDERSON, EDGAR, A Corn Cache from Western Colorado, 161.

Announcement of Annual Meeting for 1949, 256.

Annual Meeting of the Society for American Archaeology, 1948, 146.

Archaic: What is the Archaic?, 122.

Archaeological Investigations in Ellsworth and Rice Counties, Kansas, 292.

Archaeological Investigations in Medicine Creek Reservoir, Nebraska, 278.

Archaeological Reconnaissance of Lakes Mistassini and Albanel, Province of Quebec, 1947, 81.

Archaeological Researches in the Missouri Basin by the Smithsonian River Basin Surveys and Cooperating Agencies: Bibliography, 340; Foreword, 257.

Archaeology of the San Augustin Plains, a Preliminary Report, 172.

Architecture: Gallina Architectural Forms, 32; Pithouse Number 1, Mesa Verde National Park, 167.

Arctic: News of, 71.

Art: Teotihuacan Owl-and-Weapon Symbol and its Association with "Serpent Head X" at Kaminaljuyu, 129.

Astronomy: The Dark Phase of the Moon and Ancient Maya Methods of Solar Eclipse Prediction, 230; Maya Eclipse Table of the Dresden Codex: a Reply, 228; Note on the Maya Eclipse Table of the Dresden Codex, 61.

BAILEY, WILFRID C., Tree-Rings and Droughts, 59.

BALDWIN, GORDON C., Notes on Colorado River Basin Archaeology, 128.

BEARDSLEY, RICHARD K., Culture Sequences in Central California Archaeology, 1.

BENNETT, WENDELL C., Review, Some Notes on the Archaeology of the Department of Puno, Peru, 67.

Bibliography, Archaeological Researches in the Missouri Basin, 339.

BLACK, GLENN A., "Tepexpan Man," a Critique of Method, 344.

BLAIR, WILLIAM C., Additional Data on Crania from the Warren Mounds, 224.

BRAINERD, GEORGE W., Review, The Ancient Maya, 133.

Brief of Symposium on the Southern Cult, 151.

BULLEN, RIPLEY P., Culture Dynamics in Eastern Massachusetts, 36.

Burial Mounds in the Baldhill Area, North Dakota, 322.

Burials: Passadumkeag, a Red Paint Cemetery, Thirty-Five Years after Moorehead, 98; Mounds in the Baldhill Area, North Dakota, 322.

Butler, Mary, Review, Guide Book to the Ruins of Copan, 347.

California: Archaeological Survey, 222; Correction of Erroneous Illustration of a California Harpoon Type, 160; Culture Sequences in Central California Archaeology, 1; Diet and Age of the Californian Shellmounds, 223; Excavation of Tommy Tucker Cave, Lassen County, 203.

Central Andes: Tripod Pottery in the Central Andean Area, 103.

CHAMPE, JOHN L., Review, The Post-Kansan Geologic History of the Lower Platte Valley Area, 69; White Cat Village, 285.

Colorado: A Corn Cache from Western Colorado, 161; Notes on Colorado River Basin Archaeology, 128; Pithouse Number 1, Mesa Verde National Park, 167.

COLTON, HAROLD S., Review, Prehistoric Indians of the Southwest, 69.

Committee on the Interrelations of Pleistocene Research, 256.

Committees: Executive Committee Decisions, 160.

COOPER, PAUL L., Recent Investigations in Fort Randall and Oahe Reservoirs, South Dakota, 300.

Corn Cache from Western Colorado, 161.

Correction of Erroneous Illustration of a California Harpoon Type, 160.

CRESSMAN, L. S., Odell Lake Site, a New Paleo-Indian Camp Site in Oregon, 57.

Cult: Brief of Symposium on the Southern Cult, 151.

Culture Dynamics in Eastern Massachusetts, 36.

Culture Sequences in Central California Archaeology, 1.

Dark Phase of the Moon and Ancient Maya Methods of Solar Eclipse Prediction, 230.

Diagonal Flaking from Kotzebue, Alaska, 127.

Diet and Age of the Californian Shellmounds, 223.

Early Man: Archaeology of the San Augustin Plains, a Preliminary Report, 172; Committee on the Interrelations of Pleistocene Research, 256; News of, 80; Notes on the Archaeology of Utukok River, Northwestern Alaska, 62; Odell Lake Site, a New Paleo-Indian Camp Site in Oregon, 57; "Tepexpan Man," a Critique of Method, 344; Tepexpan Man not Intrusive, 160.

Eastern United States: Brief of Symposium on the Southern Cult, 151; What is the Archaic?, 122.

Ecuador: Un Vaso "Thin Orange" del pais Caranqui, 226.

EHRICH, ROBERT W., Obituary, George Grant MacCurdy, 1863–1947, 49.

EVANS, CLIFFORD, JR., Review, Indian Skeletal Material from the Central Coast of Peru, 68.

Excavation of Tommy Tucker Cave, Lassen County, California, 203.

Executive Committee Decisions, 160.

FENENGA, FRANKLIN, Excavation of Tommy Tucker Cave, Lassen County, California, 203.

Films: AAA Annual Index of 16-Millimeter Anthropological Films, 159.

Flint Stations in Central Alaska, 116.

Florida: Projectile Points from the Kissimmee Region, 127.
Foreword, Archaeological Researches in the Missouri Basin, 257.
Fourth Conference on Iroquois Research, 159.
Frontier Culture Complex, a Preliminary Report on a Prehistoric Hunter's Camp in Southwestern Nebraska, 260.
Gallina: Architectural Forms, 32; Pottery of the Gallina Complex, 194.
GIDDINGS, J. L., JR., Diagonal Flaking from Kotzebue, Alaska, 127; Flint Stations in Central Alaska, 116.
GIFFORD, E. W., Diet and Age of the Californian Shellmounds, 223.
GREENMAN, E. F., Review, Man's Unknown Ancestors, 137.
GRIFFIN, JOHN W., Upper Mississippi at the Fisher Site, 124.
Guatemala: Progress at Zaculeu, 121; The Teotihuacan Owl-and-Weapon Symbol and its Association with "Serpent Head X" at Kaminaljuyu, 129.
HADLOCK, WENDELL S., Passadumkeag, a Red Paint Cemetery, Thirty-Five Years after Moorehead, 98.
HARRISON, MARGARET W., Obituary, Sylvanus Griswold Morley, 1883–1948, 215.
HEIZER, ROBERT F., The California Archaeological Survey, 222.
HEWES, GORDON, W., Burial Mounds in the Baldhill Area North Dakota, 322.
HIBBEN, FRANK C., The Gallina Architectural Forms, 32; The Pottery of the Gallina Complex, 194.
HOLDER, PRESTON, The Frontier Culture Complex, a Preliminary Report on a Prehistoric Hunter's Camp in Southwestern Nebraska, 260.
Hopewell Tool for Decorating Pottery, 344.
HUGHES, JACK T., Investigations in Western South Dakota and Northeastern Wyoming, 266.
HURST, C. T., A Corn Cache from Western Colorado, 161.
HURT, WESLEY R., JR., Archaeology of the San Augustin Plains, a Preliminary Report, 172; Review, The SU Site, Third Season, 1946, 137.
Illinois: Upper Mississippi at the Fisher Site, 124.
Investigations in Western South Dakota and Northeastern Wyoming, 266.
Iroquois: Fourth Conference on Iroquois Research, 159.
JIJÓN Y CAAMAÑO, JACINTO, Un Vaso "This Orange" del pais Caranqui, Ecuador, 226.
JOHNSON, FREDERICK, The Rogers' Collection from Lakes Mistassini and Albanel, Province of Quebec, 91.
JONES, VOLNEY H., Review, Eastern Algonkian Block-Stamp Decoration, 138.
Kansas: Archaeological Investigations in Ellsworth and Rice Counties, 292; A Hopewell Tool for Decorating Pottery, 344.
KING, ARDEN R., Tripod Pottery in the Central Andean Area, 103.
KIVETT, MARVIN F., Archaeological Investigations in Medicine Creek Reservoir, Nebraska, 278.
KROEBER, A. L., Review, Archéologie de la Province d'Esmeraldas, Equateur, 139.
LEHMER, DONALD J., Review, Caves of the Upper Gila and Hueco Areas in New Mexico and Texas, 236.
LISTER ROBERT H., Review, The Artifacts of Uaxactun, Guatemala, 136.
LOTHROP, S. K., Obituary, Julio C. Tello, 1880–1947, 50.
MCKNIGHT, DANIEL, Archaeology of the San Augustin Plains, a Preliminary Report, 172.
MAINE: Passadumkeag, a Red Paint Cemetery, Thirty-Five Years after Moorehead, 98.
Manitoba: Unique Artifact, 126.
Massachusetts: Culture Dynamics in Eastern Massachusetts, 36.
Maya: The Dark Phase of the Moon and Ancient Maya Methods of Solar Eclipse Prediction, 230; Eclipse Table of the Dresden Codex: a Reply, 228; Note on the Maya Eclipse Table of the Dresden Codex, 61.
Meetings of the Society, 146, 256.
MEGGERS, BETTY J., Review, Prehistoric Ceramic Styles of Lowland South America, their Distribution and History, 66.
MELEEN, E. E., A Preliminary Report on the Thomas Riggs Village Site, 310.
MERRILL, ROBERT H., The Maya Eclipse Table of the Dresden Codex: a Reply, 228.
Mexico: "Tepexpan Man," a Critique of Method, 344.
Middle America: The Dark Phase of the Moon and Ancient Maya Methods of Solar Eclipse Prediction, 230; The Maya Eclipse Table of the Dresden Codex: a Reply, 228; News of, 158; News of, 254; Note on the Maya Eclipse Table of the Dresden Codex, 61.
Missouri: Nebo Hill, a Lithic Complex in Western Missouri, 29.
Missouri Basin: Recent Archaeological Researches in, 257; Some Provisional Correlations in Missouri Basin Archaeology, 328.
MOORE, SHERWOOD, On the Catlin Mark, 225.
Nebo Hill, a Lithic Complex in Western Missouri, 29.
Nebraska, Archaeological Investigations in Medicine Creek Reservoir, 278; The Frontier Culture Complex, a Preliminary Report on a Prehistoric Hunter's Camp, 260; White Cat Village, 285.
New Mexico: Archaeology of the San Augustin Plains, a Preliminary Report, 172; The Gallina Architectural Forms, 32; The Pottery of the Gallina Complex, 194.
North Dakota: Burial Mounds in the Baldhill Area, 322.
Northeast: Fourth Conference on Iroquois Research, 159; News of, 76; News of, 252.
Northern Mississippi Valley: News of, 76, 247.
Note on the Maya Eclipse Table of the Dresden Codex, 61.
Notes on Colorado River Basin Archaeology, 128.
Notes on the Archaeology of the Utukok River, Northwestern Alaska, 62.
Obituaries: John Haynes Bailey, 1909–1948, 214; George Grant MacCurdy, 1863–1947, 49; Sylvanus Griswold Morley, 1883–1948, 215; Julio C. Tello, 1880–1947, 50.
Odell Lake Site, a New Paleo-Indian Camp Site in Oregon, 57.
On the Catlin Mark, 225.
Oregon: Odell Lake Site, a New Paleo-Indian Camp Site, 57.
Pacific Coast: News of, 155.

Passadumkeag, a Red Paint Cemetery, Thirty-Five Years after Moorehead, 98.
Pithouse Number 1, Mesa Verde National Park, 167.
Plains: News of, 74, 244.
Pottery: A Hopewell Tool for Decorating Pottery, 344; The Pottery of the Gallina Complex, 194; Tripod Pottery in the Central Andean Area, 103; Vaso "Thin Orange" del pais Caranqui, Ecuador, 226.
Preliminary Report on the Thomas Riggs Village Site, 310.
Progress at Zaculeu, Guatemala, 121.
Projectile Points from the Kissimmee Region, 127.
Quebec: Archaeological Reconnaissance of Lakes Mistassini and Albanel, Province of Quebec, 1947, 81; The Rogers' Collection from Lakes Mistassini and Albanel, 91.
QUIMBY, GEORGE I., A Hopewell Tool for Decorating Pottery, 344.
Recent Investigations in Fort Randall and Oahe Reservoirs, South Dakota, 300.
Red Paint: Passadumkeag, a Red Paint Cemetery, Thirty-Five Years after Moorehead, 98.
Reviews: The Ancient Maya, 133; Anthropology, 235; The Archaic Horizon in Western Tennessee, 69; Archéologie de la Province d'Esmeraldas, Equateur, 139; The Artifacts of Uaxactun, Guatemala, 136; Caves of the Upper Gila and Hueco Areas in New Mexico and Texas, 236; Coclé, an Archaeological Study of Central Panama, Part II, 237; Culture Complexes and Chronology in Northern Texas, 140; Eastern Algonkian Block-Stamp Decoration, 138; Grassy Island, 235; Guide Book to the Ruins of Copan, 347; Indian Skeletal Material from the Central Coast of Peru, 68; Man's Unknown Ancestors, 137; Northwest Argentine Archeology, 238; The Post-Kansan Geologic History of the Lower Platte Valley Area, 69; Prehistoric Ceramic Styles of Lowland South America, their Distribution and History, 66; Prehistoric Indians of the Southwest, 69; Some Notes on the Archaeology of the Department of Puno, Peru, 67; The SU Site, Third Season, 1946, 137.
RIDDLE, FRANCIS A., Excavation of Tommy Tucker Cave, Lassen County, California, 203.
RITCHIE, WILLIAM A., Obituary, John Haynes Bailey, 1909–1948, 214.
ROGERS, EDWARD, Archaeological Reconnaissance of Lakes Mistassini and Albanel, Province of Quebec, 1947, 81.
ROGERS, MURRAY H., Archaeological Reconnaissance of Lakes Mistassini and Albanel, Province of Quebec, 1947, 81.
Rogers' Collection from Lakes Mistassini and Albanel, Province of Quebec, 91.
ROUSE, IRVING, Review, Coclé, an Archaeological Study of Central Panama, Part II, 237.
ROYS, RALPH L., Obituary, Sylvanus Griswold Morley, 1883–1948, 215.
SATTERTHWAITE, LINTON, The Dark Phase of the Moon and Ancient Maya Methods of Solar Eclipse Prediction, 230; Note on the Maya Eclipse Table of the Dresden Codex, 61.
SEARS, WILLIAM H., Review, The Archaic Horizon in Western Tennessee, 69; What is the Archaic?, 122.
SERRANO, ANTONIO, Review, Northwest Argentine Archeology, 238.
SHIPPEE, J. M., Nebo Hill, a Lithic Complex in Western Missouri, 29.
SKARLAND, IVAR, Flint Stations in Central Alaska, 116.
SMILEY, TERAH L., Pithouse Number 1, Mesa Verde National Park, 167.
SMITH, CARLYLE S., Archaeological Investigations in Ellsworth and Rice Counties, Kansas, 292; Review, Grassy Island, 235.
Society for American Archaeology Membership, 1948–1949, 348.
Some Provisional Correlations in Missouri Basin Archaeology, 328.
Some Recent Publications, 347.
South America: News of, 78, 158, 347.
South Dakota: Investigations in Western South Dakota and Northeastern Wyoming, 266; A Preliminary Report on the Thomas Riggs Village Site, 310; Recent Investigations in Fort Randall and Oahe Reservoirs, 300.
Southeast: News of, 77, 250.
Southern Cult: Brief of Symposium on, 151.
Southwest: News of, 72, 242, 347; The 1948 Southwestern Archaeological Conference, 254; Tree Rings and Droughts, 59.
SPAULDING, ALBERT C., Review, Anthropology, 235.
STERN, THEODORE, Passadumkeag, a Red Paint Cemetery, Thirty-Five Years after Moorehead, 98.
Stone Artifacts: Diagonal Flaking from Kotzebue, Alaska, 127; Nebo Hill, a Lithic Complex in Western Missouri, 29; Projectile Points from the Kissimmee Region, 127; The Rogers' Collection from Lakes Mistassini and Albanel, Province of Quebec, 91; Unique Artifact from Manitoba, 126.
Teotihuacan Owl-and-Weapon Symbol and its Association with "Serpent Head X" at Kaminaljuyu, 129.
Tepexpan Man, 80.
"Tepexpan Man," a Critique of Method, 344.
Tepexpan Man not Intrusive, 160.
THOMPSON, RAYMOND M., Notes on the Archaeology of the Utukok River, Northwestern Alaska, 62.
Tools: A Hopewell Tool for Decorating Pottery, 344.
Tree-Rings and Droughts, 59.
Tripod Pottery in the Central Andean Area, 103.
Unique Artifact from Manitoba, 126.
University of Michigan, 256.
Upper Mississippi at the Fisher Site, 124.
Utah: Additional Data on the Crania from the Warren Mounds, 224.
Vaso "Thin Orange" del pais Caranqui, Ecuador, 226.
VICKERS, CHRIS, Unique Artifact from Manitoba, 126.
WATSON, VIRGINIA, Projectile Points from the Kissimmee Region, 127.
WEBB, CLARENCE H., Review, Culture Complexes and Chronology in Northern Texas, 140.
WEDEL, WALDO R., Foreword, Archaeological Researches in the Missouri Basin, 257; Some Provisional Correlations in Missouri Basin Archaeology, 328.
What is the Archaic?, 122.
White Cat Village, 285.

WIKE, JOYCE, The Frontier Culture Complex, a Preliminary Report on a Prehistoric Hunter's Camp, in Southwestern Nebraska, 260.
WINNING, HASSO VON, The Teotihuacan Owl-and-Weapon Symbol and its Association with "Serpent Head X" at Kaminaljuyu, 129.
WOODBURY, RICHARD, Progress at Zaculeu, Guatemala, 121.
Wyoming: Investigations in Western South Dakota and Northeastern Wyoming, 266.

MEMOIRS
of the
SOCIETY FOR AMERICAN ARCHAEOLOGY

The following numbers, if in print, may be obtained from the Treasurer, Glenn A. Black:

Number 1. *Big Bead Mesa: An Archaeological Study of Navaho Acculturation, 1745–1812.* By DOROTHY LOUISE KEUR. vi + 90 pages, 4 plates, 5 figures. $1.00.

Number 2. *The Tchefuncte Culture, An Early Occupation of the Lower Mississippi Valley.* By JAMES A. FORD and GEORGE I. QUIMBY, JR., with an Appendix on the Skeletal Remains by CHARLES E. SNOW. xii + 113 pages, 12 plates, 23 figures, 3 folding tables. $1.50.

Number 3. *The Prehistory of Northern North America as Seen from the Yukon.* By FREDERICA DE LAGUNA. x + 360 pages, 30 plates, 33 figures. Out of print.

Number 4. *A Reappraisal of Peruvian Archaeology.* Assembled by WENDELL C. BENNETT. x + 128 pages, 72 figures. $2.00.

Number 5. *The George C. Davis Site, Cherokee County, Texas.* By H. PERRY NEWELL and ALEX D. KRIEGER, with an Appendix on the Corn by VOLNEY JONES. xvi + 255 pages, 66 figures, 20 tables. $3.50.

INFORMATION FOR AUTHORS

AMERICAN ANTIQUITY publishes original papers in the field of American archaeology, as well as comments, reviews, and discussions on matters pertaining to this field. Articles on other regions, or on such related subjects as geography, history, and ethnography, may be accepted if of special significance to American archaeology.

Accepted papers are published in the order of their receipt. Except for such papers as may be specially solicited, all papers bear the date of submission.

Manuscripts must be typewritten on standard 8½×11 inch paper, double spaced, and on one side of the page only. Bibliographies must follow a standard form. Citations from journals and series should be given as follows:

JENKS, ALBERT E., AND LLOYD A. WILFORD
1938. "The Sauk Valley Skeleton." *Bulletin of the Texas Archaeological and Paleontological Society*, Vol. 10, pp. 136–68. Abilene.

Citations from separate books or pamphlets:

JENKS, ALBERT E.
1936. *Pleistocene Man in Minnesota.* Minneapolis: University of Minnesota Press.

Illustrations over and above two pages of halftones or the equivalent in line cuts and tables must be paid for by the author or the author's sponsor. Photographs for reproduction should be on a glossy paper, unmounted, and of a proportion suitable for reduction to 5¾×8⅜ inches or a portion thereof, making due allowance for captions. Line drawings should be in India ink on smooth, hardsurfaced paper, with figures written lightly in pencil on the margin or the back.

Galley proof, only, will be sent to authors, who will be charged for corrections costing more than 10 per cent of our bill for composition. Upon publication, manuscripts, illustrations, and engravings will be destroyed unless their return has been specifically requested.

Reprints without covers are supplied at the following prices, if ordered with returned, corrected galley proofs:

Copies	*1–4 pp.*	*5–8 pp.*	*9–12 pp.*	*13–16 pp.*	*17–20 pp.*	*21–24 pp.*	*25–28 pp.*	*29–32 pp.*
25 or less	$4.00	$5.50	$6.00	$ 7.50	$ 9.00	$11.00	$12.00	$12.50
50	4.25	6.00	6.80	8.40	10.10	12.20	13.40	14.00
75	4.50	6.50	7.60	9.30	11.20	13.40	14.80	15.50
100	4.75	7.00	8.40	10.20	12.30	14.60	16.20	17.00
Additional 100's	1.00	2.00	3.20	3.60	4.40	4.80	5.60	6.00

Covers with title and date of issue of AMERICAN ANTIQUITY will be furnished at the following rates: 25 or less for $5.00; additional covers 2 cents each.

TABLE OF CONTENTS

ARCHAEOLOGICAL RESEARCHES IN THE MISSOURI BASIN BY THE SMITHSONIAN RIVER BASIN SURVEYS AND COOPERATING AGENCIES

Foreword . . . . . Waldo R. Wedel 257

The Frontier Culture Complex, a Preliminary Report on a Prehistoric Hunters' Camp in Southwestern Nebraska . Preston Holder and Joyce Wike 260

Investigations in Western South Dakota and Northeastern Wyoming . . . . . Jack T. Hughes 266

Archaeological Investigations in Medicine Creek Reservoir, Nebraska . . . . . Marvin F. Kivett 278

White Cat Village . . . . . John L. Champe 285

Archaeological Investigations in Ellsworth and Rice Counties, Kansas . . . . . Carlyle S. Smith 292

Recent Investigations in Fort Randall and Oahe Reservoirs, South Dakota . . . . . Paul L. Cooper 300

A Preliminary Report on the Thomas Riggs Village Site . E. E. Meleen 310

Burial Mounds in the Baldhill Area, North Dakota . . Gordon W. Hewes 322

Some Provisional Correlations in Missouri Basin Archaeology . . . . . Waldo R. Wedel 328

Bibliography 340

FACTS AND COMMENTS

A Hopewell Tool for Decorating Pottery . . . . . George I. Quimby 344

"Tepexpan Man," a Critique of Method . . . . . Glenn A. Black 344

BOOK REVIEW

Stromsvik: Guide Book to the Ruins of Copan . . . . . Butler 347

Notes and News 347

Society for American Archaeology Membership, 1948–49 348

Index of Volume XIV 357

AMERICAN ANTIQUITY IS INDEXED IN THE INTERNATIONAL INDEX

GEORGE BANTA PUBLISHING COMPANY, MENASHA, WISCONSIN

C15
0E2E
1328
2E32
3235
4530
5E85